

**STATEMENT OF TEST RESULTS**

STR/AT 777

|   |   |
|---|---|
| <i>Erzeugnis<br/>Product</i>  | Contactors and optionally used auxiliary contact blocks _____             |
| <i>Geprüft im Auftrag von<br/>Tested by request of</i>  | <b>Benedict GmbH</b><br>A-1220 Wien, Lieblgasse 7 _____                   |
| <i>Hergestellt von (Firma und Ort)<br/>Manufactured at (name and place)</i>   | <b>Benedict GmbH</b><br>A-1220 Wien, Lieblgasse 7 _____                   |
| <i>Betriebsdaten und wichtige Merkmale<br/>Rating and principal characteristics</i>   | See page 1 and 2 of test reports _____                                    |
| <i>Warenzeichen (falls vorhanden)<br/>Trade mark (if any)</i>   | <b>Ω, Benedikt &amp; Jäger</b><br>See also page 2 of test reports _____   |
| <i>Typenbezeichnung<br/>Model/Type Ref.</i>   | Contactors Series K1., K3., K..<br>See page 1 and 2 of test reports _____ |
| <i>Zusätzliche Information (falls erforderlich)<br/>Additional information (if necessary)</i>   | Test Procedures according Annex F (mirror contacts) _____                 |
| <i>Ein Muster dieses Erzeugnisses ist nach<br/>A sample of the product has been tested according to</i>   |   |
| <b>IEC 60947-4-1:2000+A1:2002-09</b> _____  |   |
| <i>befunden worden, wie es aus den Prüfberichten (Aktenzeichen/Nr.) CTI-PA 1824-1 to 1824-5 hervorgeht.<br/>as shown in the test reports (reference No.).</i> |   |

Diese Mitteilung von Prüfergebnissen ist das Ergebnis einer Prüfung, die an einem eingereichten Muster eines Erzeugnisses nach den Bestimmungen der genannten Norm durchgeführt worden ist. Diese Mitteilung von Prüfergebnissen ist von einer Stelle ausgestellt worden, die direkt am CENELEC-Zertifizierungs-Abkommen (CCA) vom 11. September 1973 in der Fassung vom 29. März 1983 teilnimmt. Jede andere am CCA teilnehmende Stelle nimmt diese Mitteilung von Prüfergebnissen als Grundlage für die Erteilung eines nationalen Konformitätszeichens (Prüfzeichens) oder einer nationalen Zulassung, wie es im OD CCA 226, Zusammenstellung der Beschlüsse der CCA Gruppe, Punkt 2.11 festgelegt ist.

*Jri*

Wien, 2003-08-19

This Statement of Test Results is the result of testing a sample of the product submitted, in accordance with the provisions of the above mentioned standard.

This Statement of Test Results has been established by a body which participates directly in the CENELEC Certification Agreement (CCA) of 11th September 1973 as amended on 29th March 1983. Any other body participating in the CCA will take this Statement of Test Results as a basis for granting a national mark of conformity or a national approval as specified in the OD CCA 226, List of current decisions of CCA Group, point 2.11.

Österreichischer Verband für Elektrotechnik

Österreichischer Verband für Elektrotechnik  
Sektor  
Prüfwesen & Zertifizierung



Dipl.-Ing. W. MARTIN  
Head of Testing & Certification

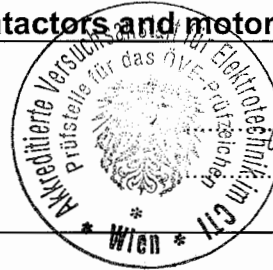
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Accredited by the Austrian Ministry of Economic Affairs as Certification Body and Inspection Body for products, services, process and system evaluation in the whole field of electrotechnology



| <b>TEST REPORT</b><br><b>IEC 60 947-4-1</b><br><b>Low-voltage switchgear and controlgear</b><br><b>Part 4: Contactors and motor-starters</b><br><b>Section 1: Electromechanical contactors and motor-starters</b> |   |
|---|---|
| Report reference No. :  | CTI – PA 1824-1   |
| Tested by (+ signature) .....   | Ing. H. Hausl   |
| Approved by (+ signature) .....   | J. Wolf   |
| Date of issue .....   | 14.08.2003  |
| Testing laboratory .....  | CTI-Vienna  |
| Address .....   | A – 1210 Vienna, Einzingerasse 4  |
| Testing location .....  | as above  |
| Applicant .....   | Benedict GmbH   |
| Address .....   | A – 1220 Vienna, Lieblgasse 7   |
| Standard .....  | IEC 60 947-4-1:2000-11 + A1:2002-09   |
| Test Report Form No .....   | 69474-1A modified   |
| Master TRF .....  | reference No. 69474-1A, dated 95-07   |
| Copyright blank test report .....   | the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). |
| Test procedure .....  | STR   |
| Procedure deviation .....   | only requirements according to ANNEX F have been tested   |
| Non-standard test method .....  | N.A.  |
| Type of test object .....   | Contactors (K1) and optionally used Auxiliary Contact Blocks (HK)   |
| Trademark .....   | Ω, Benedikt & Jäger   |
| Model/type reference .....  | K1-09..., K1-12..., HK...   |
| Manufacturer .....  | Ω Benedikt & Jäger  |
| Rating .....  | 20A, 20A, 10A (690V 50-60Hz)  |



Handwritten signatures of H. Hausl and J. Wolf.

|                           |                              |
|---------------------------|------------------------------|
| Further Trademark .....   | SCHRACK                      |
| Model/type reference..... | LA1.09.., LA1.12.., LA1901.. |
| Manufacturer .....        | Ω Benedikt & Jäger           |
| Rating .....              | 20A, 20A, 10A (690V 50-60Hz) |

|                           |                              |
|---------------------------|------------------------------|
| Further Trademark .....   | IMO                          |
| Model/type reference..... | MB09..., MB12..., M.A-...    |
| Manufacturer .....        | Ω Benedikt & Jäger           |
| Rating .....              | 20A, 20A, 10A (690V 50-60Hz) |

|                           |                                      |
|---------------------------|--------------------------------------|
| Further Trademark .....   | OMRON                                |
| Model/type reference..... | 7JKNA-09..., 7JKNA-12..., J73KN-A... |
| Manufacturer .....        | Ω Benedikt & Jäger                   |
| Rating .....              | 20A, 20A, 10A (690V 50-60Hz)         |

Copy of marking plate (B&J represents all other Brands)








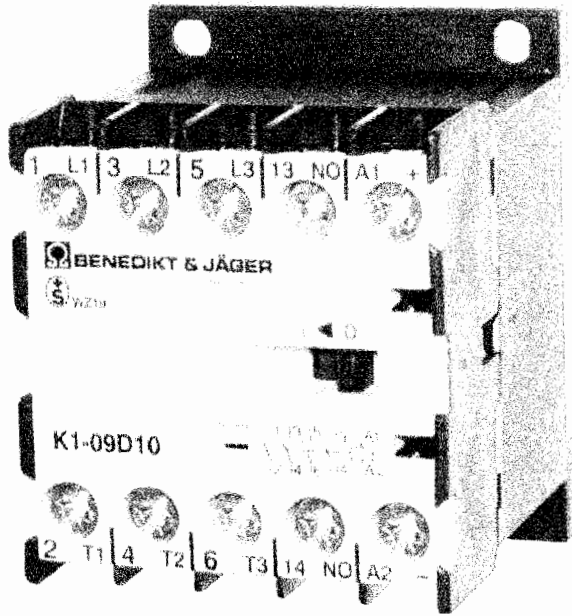
|  |     |     |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
|--|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|--------|-----|---|---|-----|--------|-----|-----|---|---|---|----|-----|-----|--|-----|-----|--------|-----|-----|-----|-----|--------|---|---|-----|----|--------|-----|---|---|---|---|----|-----|-----|--|-----|-----|
| <p>Contactor</p> <p>K1-09</p> <p>IEC/EN60947-4-1<br/>VDE0660</p> <p><b>AC3 9A</b><br/>400V~</p> <p>AC1 = I<sub>th</sub><br/>690V~ 20A</p> <p>AC2, AC3</p> <table border="1"> <tr> <td>V~</td> <td>220</td> <td>380</td> </tr> <tr> <td></td> <td>240</td> <td>690</td> </tr> </table> <p>kW   3   4</p> <p> Made in Austria</p> <hr/> <p> LISTED IND. CONT. EQ. 93B2<br/>600v ac 15amp.<br/>Aux. Cont.<br/>A600 Q600</p> <table border="1"> <tr> <td>v max.</td> <td>120</td> <td>240</td> <td>480</td> <td>600</td> </tr> <tr> <td>hp 3ph</td> <td>1.5</td> <td>3</td> <td>5</td> <td>7.5</td> </tr> <tr> <td>hp 1ph</td> <td>0.5</td> <td>1.5</td> <td>-</td> <td>-</td> </tr> </table> <p>14AWG - 18AWG WIRE<br/>60/75°C Cu only<br/>TIGHT TORQUE 9 lb.-in.<br/>SUITABLE FOR USE ON A CIRCUIT OF DELIVERING 5000RMS SYM. AMP.<br/>600 VOLTS AC MAXIMUM<br/>MAX. FUSE SIZE 30 AMP.</p> | V~  | 220 | 380 |     | 240 | 690 | v max. | 120 | 240 | 480 | 600 | hp 3ph | 1.5 | 3 | 5 | 7.5 | hp 1ph | 0.5 | 1.5 | - | - | <p>K1-12</p> <p>IEC/EN60947-4-1<br/>VDE0660</p> <p><b>AC3 12A</b><br/>400V~</p> <p>AC1 = I<sub>th</sub><br/>690V~ 20A</p> <p>AC2, AC3</p> <table border="1"> <tr> <td>V~</td> <td>220</td> <td>380</td> </tr> <tr> <td></td> <td>240</td> <td>690</td> </tr> </table> <p>kW   4   5,5</p> <p> Made in Austria</p> <hr/> <p> LISTED IND. CONT. EQ. 93B2<br/>600v ac 20amp.<br/>Aux. Cont.<br/>A600 Q600</p> <table border="1"> <tr> <td>v max.</td> <td>120</td> <td>240</td> <td>480</td> <td>600</td> </tr> <tr> <td>hp 3ph</td> <td>2</td> <td>3</td> <td>7.5</td> <td>10</td> </tr> <tr> <td>hp 1ph</td> <td>.75</td> <td>2</td> <td>-</td> <td>-</td> </tr> </table> <p>14AWG - 18AWG WIRE<br/>60/75°C Cu only<br/>TIGHT TORQUE 9 lb.-in.<br/>SUITABLE FOR USE ON A CIRCUIT OF DELIVERING 5000RMS SYM. AMP.<br/>600 VOLTS AC MAXIMUM<br/>MAX. FUSE SIZE 30 AMP.</p> | V~ | 220 | 380 |  | 240 | 690 | v max. | 120 | 240 | 480 | 600 | hp 3ph | 2 | 3 | 7.5 | 10 | hp 1ph | .75 | 2 | - | - | <p>Auxiliary Contact Block</p> <p>HK...</p> <p>IEC/EN60947-5-1<br/>VDE0660</p> <p>AC1 = I<sub>th</sub><br/>690V~ 10A</p> <p>AC15</p> <table border="1"> <tr> <td>V~</td> <td>220</td> <td>380</td> </tr> <tr> <td></td> <td>240</td> <td>415</td> </tr> </table> <p>A   3   2</p> <p>  WZ 19</p> <hr/> <p> LISTED IND. CONT. EQ. 93B2<br/>600v ac 10amp<br/>A600 Q600</p> <p>Made in Austria</p> | V~ | 220 | 380 |  | 240 | 415 |
| V~   | 220 | 380 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
|  | 240 | 690 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| v max.   | 120 | 240 | 480 | 600 |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| hp 3ph   | 1.5 | 3   | 5   | 7.5 |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| hp 1ph   | 0.5 | 1.5 | -   | -   |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| V~   | 220 | 380 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
|  | 240 | 690 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| v max.   | 120 | 240 | 480 | 600 |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| hp 3ph   | 2   | 3   | 7.5 | 10  |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| hp 1ph   | .75 | 2   | -   | -   |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
| V~   | 220 | 380 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |
|  | 240 | 415 |     |     |     |     |        |     |     |     |     |        |     |   |   |     |        |     |     |   |   |   |    |     |     |  |     |     |        |     |     |     |     |        |   |   |     |    |        |     |   |   |   |   |    |     |     |  |     |     |

Photo:

K1-09D represents all other Brands and Types



HK.. represents all other Brands and Types



## Test item particulars:

- method of operation ..... : Magnetic
- switching positions ..... : ON-OFF
- number of poles ..... : 3 Main 1 Aux
- kind of current ..... : AC
- number of phases ..... : 3
- rated frequency (Hz) ..... : 50-60
- number of positions of main contacts ..... : 2

## Rated and limiting values, main circuit..... :

- rated operational voltage  $U_e$  (V) ..... : 690
- rated insulation voltage  $U_i$  (V) ..... : 690
- rated impulse withstand voltage  $U_{imp}$  (kV) ..... : 8
- conventional free air thermal current  $I_{th}$  (A) ..... : 20
- conventional enclosed thermal current  $I_{the}$  (A) ..... : -
- rated operational current  $I_e$  (A) ..... : 20
- rated uninterrupted  $I_u$  (A) ..... : 20
- utilization category ..... : AC1

## Short-circuit characteristic ..... :

- rated prospective short-circuit current "r" (kA) ..... : 1
- rated conditional short-circuit current  $I_q$  (kA) ..... : 1

## Rated and limiting values, auxiliary circuits..... :

- rated operational voltage (V) ..... : 690
- rated frequency (Hz) ..... : 50-60
- number of circuits ..... : 1
- number and kind of contact elements ..... : 1 NO or 1 NC

## Co-ordination of short-circuit protective devices ..... : Type "1"

- kind of protective device ..... : Fuse 35A gL/gG

## Possible test case verdicts:

- test case does not apply to the test object ..... : N(.A.)
- test object does meet the requirement ..... : P(ass)
- test object does not meet the requirement ..... : F(ail)

**General remarks:**

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IEC 60947-4-1/A1:2002-09.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

- 1. The contactors K1-09/12... are covered in CB-AT 1059**
- 2. The auxiliary contact block HK... is covered in CB-AT 1061.**
- 3. All operational performance capability tests have been performed with K1-09 (= smallest size) contactors with ratings of K1-12 (=biggest size) contactors.**
- 4. All mechanical (mirror contacts) tests have been performed with K1-12 contactors based on the smallest contact gaps at this device.**
- 5. This report was modified to cover the requirements of ANNEX F of IEC 60947-4-1/A1:2002-09, all other items have been deleted.**

**Ordering key:**

Contactors

K1-09xxx ... see CB-AT 1059

Auxiliary Contact Block

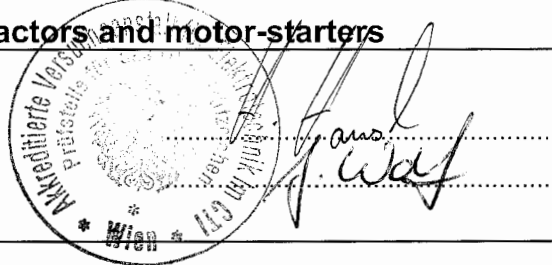
HKxxx ... see CB-AT 1061

| IEC 60 947-4-1 |   |  |         |
|----------------|---|--|---------|
| Clause         | Requirement – Test  | Result - Remark                                  | Verdict |
| F.4            | Mirror contacts shall be clearly identified:                  |  | P       |
|                | - on the contactor  | ---  | N       |
|                | - in the manufacturer documentation                           | P  | P       |
|                | Correct symbol used   | P  | P       |
| F.7.4          | Test for mirror contacts                                      | K1-12 + HK                                       | P       |
| F.7.4.1        | Tests on products in a new condition                          |  | P       |
| a)             | Designation of welded main pole .....                         | 1(L1) – 1 (T1)                                   |         |
|                | Method used .....   | soldering  |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV .....              | 2,5  |         |
| or b2)         | Contact gap (mm) – required 0,5mm.....                        | ---  |         |
|                | Designation of tested mirror contact .....                    | 21-22  | P       |
|                | Designation of tested mirror contact .....                    | 11-12  | P       |
|                | Designation of tested mirror contact .....                    | 31-32  | P       |
|                | Designation of tested mirror contact .....                    | 41-42  | P       |
|                | Designation of tested mirror contact .....                    | 51-52  | P       |
| F.7.4.2        | Test after conventional operational performance :             | K1-09 + HK                                       | P       |
|                | utilization category .....                                    | AC1  | —       |
|                | rated operational voltage (V) .....                           | 690  | —       |
|                | rated operational current I <sub>e</sub> (A) or power (kW) .. | 20   | —       |
|                | Test conditions for make/break operations AC-1 only:          |  | P       |
|                | test voltage (V) .....  | L1: 730 (required: 725 V)<br>L2: 728<br>L3: 730  | —       |
|                | test current (A) .....  | L1: 21<br>L2: 21<br>L3: 21                       | —       |
|                | power factor/time constant .....                              | L1: 0,84 (required: 0,8)<br>L2: 0,84<br>L3: 0,84 | —       |
|                | - on-time (ms) .....  | 200  | —       |
|                | - off-time (s) .....  | 3  | —       |
|                | - number of operating cycles .....                            | 6000   | P       |

| IEC 60 947-4-1 |  |                        |         |
|----------------|--|------------------------|---------|
| Clause         | Requirement – Test   | Result - Remark        | Verdict |
| 9.3.3.6.6      | Behaviour and condition during and after the test:   |                        | P       |
|                | - no permanent arcing  | P                      | P       |
|                | - no flash-over between poles  | P                      | P       |
|                | - no blowing of the fusible element in the earth circuit   | P                      | P       |
|                | - no welding of the contacts   | P                      | P       |
|                | - the contacts shall operate when the contactor or starter is switched by the applicable method of control | P                      | P       |
|                | Dielectric verification :  |                        | P       |
|                | test voltage (V) .....:  | 2,5kV (required: 690V) | P       |



| <b>TEST REPORT</b><br><b>IEC 60 947-4-1</b><br><b>Low-voltage switchgear and controlgear</b><br><b>Part 4: Contactors and motor-starters</b><br><b>Section 1: Electromechanical contactors and motor-starters</b> |   |
|---|---|
| Report reference No. :  | CTI – PA 1824-2   |
| Tested by (+ signature) .....   | Ing. H. Hausl   |
| Approved by (+ signature) .....   | J. Wolf   |
| Date of issue .....   | 14.08.2003  |
| Testing laboratory .....  | CTI-Vienna  |
| Address .....   | A – 1210 Vienna, Einzingerasse 4  |
| Testing location .....  | as above  |
| Applicant .....   | Benedict GmbH   |
| Address .....   | A – 1220 Vienna, Lieblgasse 7   |
| Standard .....  | IEC 60 947-4-1:2000-11 + A1:2002-09   |
| Test Report Form No. ....   | 69474-1A modified   |
| Master TRF .....  | reference No. 69474-1A, dated 95-07   |
| Copyright blank test report .....   | the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). |
| Test procedure .....  | STR   |
| Procedure deviation .....   | only requirements according to ANNEX F have been tested   |
| Non-standard test method .....  | N.A.  |
| Type of test object .....   | Contactors (K3) and optionally used Auxiliary Contact Blocks (H)  |
| Trademark .....   | Ω, Benedikt & Jäger   |
| Model/type reference .....  | K3-10..., K3-14..., K3-18..., K3-22...,<br>HN..., HA...   |
| Manufacturer .....  | Ω Benedikt & Jäger  |
| Rating .....  | 25A, 32A (690V 50-60Hz)<br>10A, 25A (690V 50-60Hz)  |



|                           |  |
|---------------------------|--|
| Further Trademark .....   | SCHRACK  |
| Model/type reference..... | LA3010..., LA3014..., LA3018..., LA3022...,<br>HN..., HA...  |
| Manufacturer .....        | Ω Benedikt & Jäger   |
| Rating .....              | 25A, 25A, 32A, 32A (690V 50-60Hz)<br>10A, 25A (690V 50-60Hz) |

|                           |  |
|---------------------------|--|
| Further Trademark .....   | IMO  |
| Model/type reference..... | MC10-S..., MC14-S..., MC18-S..., MC22-S...,<br>MCA-..., MCAH-... |
| Manufacturer .....        | Ω Benedikt & Jäger   |
| Rating .....              | 25A, 25A, 32A, 32A (690V 50-60Hz)<br>10A, 25A (690V 50-60Hz)     |

|                           |   |
|---------------------------|---|
| Further Trademark .....   | OMRON   |
| Model/type reference..... | 7JKN-10..., 7JKN-14..., 7JKN-18..., 7JKN-22...<br>7J3KN-B-..., J73KN-BA-... |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 25A, 25A, 32A, 32A (690V 50-60Hz)<br>10A, 25A (690V 50-60Hz)                |

Copy of marking plate (B&J represents all other Brands)

Contactor

K3-10

K3-14

K3-18

K3-22

**AC3 400V~ 10A**

|                   |            |                     |      |
|-------------------|------------|---------------------|------|
| IEC / EN60947-4-1 |            | AC1=I <sub>th</sub> |      |
| VDE0660           | AS3947-4-1 | 690V~ 25A           |      |
| AC2, AC3          | 220        | 380                 | 415  |
| V~                | 240        | 400                 | 440  |
|                   |            | 500                 | 660  |
|                   |            | 5,5                 | 6,90 |
| kW                | 3          | 4                   | 4,5  |
|                   |            | 5,5                 | 5,5  |



LISTED IND. CONT. EQUIP. 93B2

US 600V ac 25amp A600

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| 3ph hp    | 1,5 | 2   | 3   | 5   | 7,5 |
| 1ph 2p hp | 0,5 | 1   | 1,5 | 3   | 3   |

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPS 600 VOLTS MAX. WHEN PROTECTED BY A FUSE RATED 45 AMP.

TIGHTENING TORQUE 8.1 lb.-in.  
14AWG-10AWG  
WIRE 60°C Cu ONLY

**AC3 400V~ 14A**

|                   |            |                     |      |
|-------------------|------------|---------------------|------|
| IEC / EN60947-4-1 |            | AC1=I <sub>th</sub> |      |
| VDE0660           | AS3947-4-1 | 690V~ 25A           |      |
| AC2, AC3          | 220        | 380                 | 415  |
| V~                | 240        | 400                 | 440  |
|                   |            | 500                 | 660  |
|                   |            | 7,5                 | 6,90 |
| kW                | 4          | 5,5                 | 6    |
|                   |            | 7,5                 | 7,5  |



LISTED IND. CONT. EQUIP. 93B2

US 600V ac 25amp A600

|           |      |     |     |     |     |
|-----------|------|-----|-----|-----|-----|
| v         | 115  | 200 | 230 | 460 | 575 |
| 3ph hp    | 2    | 3   | 3   | 7,5 | 10  |
| 1ph 2p hp | 0,75 | 1,5 | 2   | 5   | 5   |

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPS 600 VOLTS MAX. WHEN PROTECTED BY A FUSE RATED 50 AMP.

TIGHTENING TORQUE 8.1 lb.-in.  
14AWG-10AWG  
WIRE 60°C Cu ONLY

**AC3 400V~ 18A**

|                   |            |                     |     |
|-------------------|------------|---------------------|-----|
| IEC / EN60947-4-1 |            | AC1=I <sub>th</sub> |     |
| VDE0660           | AS3947-4-1 | 690V~ 32A           |     |
| AC2, AC3          | 220        | 380                 | 415 |
| V~                | 240        | 400                 | 440 |
|                   |            | 500                 | 660 |
|                   |            | 10                  | 10  |
| kW                | 5          | 7,5                 | 8,5 |
|                   |            | 10                  | 10  |



LISTED IND. CONT. EQUIP. 93B2

US 600V ac 30amp A600

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| 3ph hp    | 2   | 3   | 5   | 10  | 15  |
| 1ph 2p hp | 1   | 2   | 3   | 5   | 7,5 |

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPS 600 VOLTS MAX. WHEN PROTECTED BY A FUSE RATED 70 AMP.

TIGHTENING TORQUE 8.1 lb.-in.  
14AWG-10AWG  
WIRE 60°C Cu ONLY

**AC3 400V~ 22A**

|                   |            |                     |     |
|-------------------|------------|---------------------|-----|
| IEC / EN60947-4-1 |            | AC1=I <sub>th</sub> |     |
| VDE0660           | AS3947-4-1 | 690V~ 32A           |     |
| AC2, AC3          | 220        | 380                 | 415 |
| V~                | 240        | 400                 | 440 |
|                   |            | 500                 | 660 |
|                   |            | 15                  | 10  |
| kW                | 6          | 11                  | 12  |
|                   |            | 15                  | 10  |



LISTED IND. CONT. EQUIP. 93B2

US 600V ac 30amp A600

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| 3ph hp    | 3   | 5   | 7,5 | 15  | 20  |
| 1ph 2p hp | 1,5 | 3   | 3   | 7,5 | 10  |

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPS 600 VOLTS MAX. WHEN PROTECTED BY A FUSE RATED 90 AMP.

TIGHTENING TORQUE 8.1 lb.-in.  
14AWG-10AWG  
WIRE 60°C Cu ONLY

Auxiliary Contact Block

HN

IEC/EN60947-5-1 VDE0660

AC1 10A 690V~

AC15 V~ | 230 | 400 | 500 | 690

A | 3 | 2 | 1,2 | 0,5



Made in Austria

**BENEDIKT & JÄGER HN10**

LISTED IND. CONT. EQ. 93B3 A600

To be used with series K/LA contactors | WZ19

HA



IEC / EN60947-5-1 VDE0660

AC1 25A 690V~

AC15 V~ | 230 | 400 | 500 | 690

A | 6 | 3 | 2 | 1

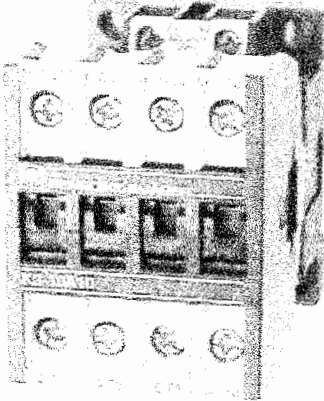
Made in Austria



LISTED IND. CONT. EQ. 93B3 A600  
To be used with contactors

Photo:

K3-10 represents all other Brands and Types



HN represents all other Brands and Types



HA represents all other Brands and Types



## Test item particulars:

- method of operation ..... : Magnetic
- switching positions ..... : ON-OFF
- number of poles ..... : 3 Main 1 Aux
- kind of current ..... : AC
- number of phases ..... : 3
- rated frequency (Hz) ..... : 50-60

- number of positions of main contacts ..... : 2

## Rated and limiting values, main circuit..... :

- rated operational voltage  $U_e$  (V) ..... : 690
- rated insulation voltage  $U_i$  (V) ..... : 690
- rated impulse withstand voltage  $U_{imp}$  (kV) ..... : 8
- conventional free air thermal current  $I_{th}$  (A) ..... : 25      25      32      32
- conventional enclosed thermal current  $I_{the}$  (A) ..... : -
- rated operational current  $I_e$  (A) ..... : 25      25      32      32
- rated uninterrupted  $I_u$  (A) ..... : 25      25      32      32
- utilization category ..... : AC1

## Short-circuit characteristic ..... :

- rated prospective short-circuit current "r" (kA) ..... : 10
- rated conditional short-circuit current  $I_q$  (kA) ..... : 10

## Rated and limiting values, auxiliary circuits..... :

- rated operational voltage (V) ..... : 690
- rated frequency (Hz) ..... : 50-60
- number of circuits ..... : 1
- number and kind of contact elements ..... : 1 NO or 1 NC

## Co-ordination of short-circuit protective devices ..... : Type "1"

- kind of protective device ..... : Fuse 63A gL/gG or circuit breaker

## Possible test case verdicts:

- test case does not apply to the test object ..... : N(.A.)
- test object does meet the requirement ..... : P(ass)
- test object does not meet the requirement ..... : F(ail)

**General remarks:**

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IEC 60947-4-1/A1:2002-09.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

- 1. The contactors K3-10/14/18/22... are covered in CB-AT 1285.**
- 2. The auxiliary contact blocks HN... and HA... are covered in CB-AT 1061.**
- 3. All operational performance capability tests have been performed with K3-10 (= smallest size) contactors with ratings of K3-22 (=biggest size) contactors.**
- 4. All mechanical (mirror contacts) tests are performed with K3-22 contactors based on the smallest contact gaps at this device.**
- 5. This report was modified to cover the requirements of ANNEX F of IEC 60947-4-1/A1:2002-09, all other items have been deleted.**

**Ordering key:****Contactors**

K3-10xxx ... see CB-AT 1285

**Auxiliary Contact Block**

HNxxx ... see CB-AT 1061

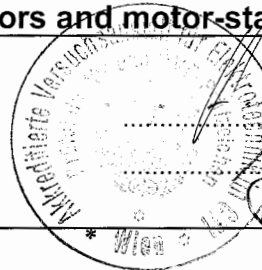
HAxxx ... see CB-AT 1061

| IEC 60 947-4-1 |  |                 |         |
|----------------|--|-----------------|---------|
| Clause         | Requirement – Test                                   | Result - Remark | Verdict |
| F.4            | Mirror contacts shall be clearly identified:         |                 | P       |
|                | - on the contactor                                   | ---             | N       |
|                | - in the manufacturer documentation                  | P               | P       |
|                | Correct symbol used                                  | P               | P       |
| F.7.4          | Test for mirror contacts                             | K3-22 + HN      | P       |
| F.7.4.1        | Tests on products in a new condition                 |                 | P       |
| a)             | Designation of welded main pole .....                | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                                   | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV .....     | 2,5             |         |
| or b2)         | Contact gap (mm) – requiret 0,5mm .....              | ---             |         |
|                | Designation of tested mirror contact .....           | 21-22           | P       |
|                | Designation of tested mirror contact .....           | 11-12           | P       |
|                | Designation of tested mirror contact .....           | 31-32           | P       |
|                | Designation of tested mirror contact .....           | 41-42           | P       |
|                | Designation of tested mirror contact .....           | 51-52           | P       |
| F.7.4          | Test for mirror contacts                             | K3-22 + HA      | P       |
| F.7.4.1        | Tests on products in a new condition                 |                 | P       |
| a)             | Designation of welded main pole .....                | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                                   | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV .....     | 2,5             |         |
| or b2)         | Contact gap (mm) – requiret 0,5mm .....              | ---             |         |
|                | Designation of tested mirror contact .....           | 21-22           | P       |
|                | Designation of tested mirror contact .....           | 11-12           | P       |
|                | Designation of tested mirror contact .....           | 31-32           | P       |
|                | Designation of tested mirror contact .....           | 41-42           | P       |
|                | Designation of tested mirror contact .....           | 51-52           | P       |
| F.7.4.2        | Test after conventional operational performance :    | K3-10 +HA + HN  | P       |
|                | utilization category .....                           | AC1             | ---     |
|                | rated operational voltage (V) .....                  | 690             | ---     |
|                | rated operational current Ie (A) or power (kW) ..    | 32              | ---     |
|                | Test conditions for make/break operations AC-1 only: |                 | P       |

| IEC 60 947-4-1 |  |  |         |
|----------------|--|--|---------|
| Clause         | Requirement – Test   | Result - Remark                                  | Verdict |
|                | test voltage (V) .....   | L1: 725 (required: 725 V)<br>L2: 725<br>L3: 725  | —       |
|                | test current (A) .....   | L1: 32<br>L2: 32<br>L3: 32                       | —       |
|                | power factor/time constant .....   | L1: 0,85 (required: 0,8)<br>L2: 0,85<br>L3: 0,85 | —       |
|                | - on-time (ms) .....   | 200  | —       |
|                | - off-time (s) .....   | 4  | —       |
|                | - number of operating cycles .....   | 6000   | P       |
| 9.3.3.6.6      | Behaviour and condition during and after the test:   |  | P       |
|                | - no permanent arcing  | P  | P       |
|                | - no flash-over between poles  | P  | P       |
|                | - no blowing of the fusible element in the earth circuit   | P  | P       |
|                | - no welding of the contacts   | P  | P       |
|                | - the contacts shall operate when the contactor or starter is switched by the applicable method of control | P  | P       |
|                | Dielectric verification :  |  | P       |
|                | test voltage (V) .....   | 2,5kV (required: 690V)                           | P       |



| <b>TEST REPORT</b><br><b>IEC 60 947-4-1</b><br><b>Low-voltage switchgear and controlgear</b><br><b>Part 4: Contactors and motor-starters</b><br><b>Section 1: Electromechanical contactors and motor-starters</b> |   |
|---|---|
| Report reference No. :  | CTI – PA 1824-3   |
| Tested by (+ signature) .....   | Ing. H. Hausl                          |
| Approved by (+ signature) .....   | J. Wolf                                |
| Date of issue .....   | 14.08.2003  |
| Testing laboratory .....  | CTI-Vienna  |
| Address .....   | A – 1210 Vienna, Einzingerasse 4  |
| Testing location .....  | as above  |
| Applicant .....   | Benedict GmbH   |
| Address .....   | A – 1220 Vienna, Lieblgasse 7   |
| Standard .....  | IEC 60 947-4-1:2000-11 + A1:2002-09   |
| Test Report Form No. ....   | 69474-1A modified   |
| Master TRF .....  | reference No. 69474-1A, dated 95-07   |
| Copyright blank test report .....   | the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). |
| Test procedure .....  | STR   |
| Procedure deviation .....   | only requirements according to ANNEX F have been tested   |
| Non-standard test method .....  | N.A.  |
| Type of test object .....   | Contactors (K3) and optionally used Auxiliary Contact Blocks (H)  |
| Trademark .....   | Ω, Benedikt & Jäger   |
| Model/type reference .....  | K3-24..., K3-32..., K3-40...,<br>HN..., HA..., HB...  |
| Manufacturer .....  | Ω Benedikt & Jäger  |
| Rating .....  | 50A, 65A, 80A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz)  |



|                           |  |
|---------------------------|--|
| Further Trademark .....   | SCHRACK  |
| Model/type reference..... | LA3024..., LA3032..., LA3040...,<br>HN..., HA..., HB...      |
| Manufacturer .....        | Ω Benedikt & Jäger   |
| Rating .....              | 50A, 65A, 80A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz) |


|                           |   |
|---------------------------|---|
| Further Trademark .....   | IMO   |
| Model/type reference..... | MC24-S..., MC32-S..., MC40-S...,<br>MCA-..., MCAH-..., MCAS-... |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 50A, 65A, 80A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz)    |

|                           |   |
|---------------------------|---|
| Further Trademark .....   | OMRON   |
| Model/type reference..... | 7JKN-24..., 7JKN-32..., 7JKN-40...,<br>7J3KN-B-..., J73KN-BA-..., J73KN-C-... |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 50A, 65A, 80A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz)                  |


Copy of marking plate (B&J represents all other Brands)

Contactor

**K3-24**

IEC/EN 60947-4-1 AS3947-4-1  
 VDE0660 AC1=I<sub>th</sub> 50A 690V~  
**AC3 400V 24A**   
 AC2, AC3

|    |     |     |     |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| V~ | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 | 690 |
| kW | 6   | 7   | 11  | 12  | 15  |     |     |     |     |


LISTED IND. CONT.  
 EQUIP 93B2  
 **us** 600v ac 50amp A600  
 v | 115 | 200 | 230 | 460 | 575

|           |     |   |     |    |    |
|-----------|-----|---|-----|----|----|
| 3ph hp    | 3   | 5 | 7,5 | 15 | 20 |
| 1ph 2p hp | 1,5 | 3 | 7,5 | 10 |    |


TORQUE 1.8Nm / 16lb.-inch  
 14AWG-4AWG  
 Cu wire min. 60/75°C only  
 Made in Austria

SUITABLE FOR USE ON A CIRCUIT  
 CAPABLE OF DELIVERING NOT MORE  
 THAN 5000 RMS SYMMETRICAL AMPS  
 600 VOLTS MAX. WHEN PROTECTED  
 BY A FUSE RATED 90 AMP.

**K3-32**

IEC/EN 60947-4-1 AS3947-4-1  
 VDE0660 AC1=I<sub>th</sub> 65A 690V~  
**AC3 400V 32A**   
 AC2, AC3

|    |     |     |     |     |      |     |     |     |     |
|----|-----|-----|-----|-----|------|-----|-----|-----|-----|
| V~ | 220 | 230 | 240 | 380 | 400  | 415 | 440 | 500 | 690 |
| kW | 8,5 | 9   | 15  | 16  | 18,5 |     |     |     |     |


LISTED IND. CONT.  
 EQUIP 93B2  
 **us** 600v ac 65amp A600  
 v | 115 | 200 | 230 | 460 | 575

|           |   |     |    |    |    |
|-----------|---|-----|----|----|----|
| 3ph hp    | 5 | 7,5 | 10 | 20 | 25 |
| 1ph 2p hp | 2 | 5   | 5  | 10 | 15 |


TORQUE 1.8Nm / 16lb.-inch  
 14AWG-4AWG  
 Cu wire min. 60/75°C only  
 Made in Austria

SUITABLE FOR USE ON A CIRCUIT  
 CAPABLE OF DELIVERING NOT MORE  
 THAN 5000 RMS SYMMETRICAL AMPS  
 600 VOLTS MAX. WHEN PROTECTED  
 BY A FUSE RATED 125 AMP.

**K3-40**

IEC/EN 60947-4-1 AS3947-4-1  
 VDE0660 AC1=I<sub>th</sub> 80A 690V~  
**AC3 400V 40A**   
 AC2, AC3

|    |     |      |      |     |      |     |     |     |     |
|----|-----|------|------|-----|------|-----|-----|-----|-----|
| V~ | 220 | 230  | 240  | 380 | 400  | 415 | 440 | 500 | 690 |
| kW | 11  | 11,5 | 18,5 | 20  | 18,5 |     |     |     |     |

LISTED IND. CONT.  
 EQUIP 93B2  
 **us** 600v ac 80amp A600  
 v | 115 | 200 | 230 | 460 | 575


|           |     |     |     |    |    |
|-----------|-----|-----|-----|----|----|
| 3ph hp    | 7,5 | 10  | 15  | 25 | 30 |
| 1ph 2p hp | 3   | 7,5 | 7,5 | 15 | 20 |

TORQUE 1.8Nm / 16lb.-inch  
 14AWG-4AWG  
 Cu wire min. 60/75°C only  
 Made in Austria

SUITABLE FOR USE ON A CIRCUIT  
 CAPABLE OF DELIVERING NOT MORE  
 THAN 5000 RMS SYMMETRICAL AMPS  
 600 VOLTS MAX. WHEN PROTECTED  
 BY A FUSE RATED 175 AMP.



Auxiliary Contact Block


**HN**

IEC/EN60947-5-1 VDE0660  
 AC1 10A 690V~   
**AC15 V~ | 230 | 400 | 500 | 690**  
 A | 3 | 2 | 1,2 | 0,5 Made in Austria

 **BENEDIKT & JÄGER HN10**  
 LISTED IND. CONT.  
 **us** EQ. 93B3 A600  
 To be used with series K/LA contactors |  WZ19

**HA**

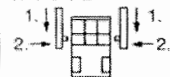
  
 IEC/EN60947-5-1 VDE0660  
 AC1 25A 690V~  
**AC15 V~ | 230 | 400 | 500 | 690**  
 A | 6 | 3 | 2 | 1   
 Made in Austria

 LISTED IND. CONT. EQ. 93B3  
**us** A600  
 To be used with contactors

**HB**



IEC/EN60947-5-1  
 VDE0660  
 AC1=I<sub>th</sub> 690V~ 10A  
 AC15  
 12201390 Made in  
 V~ 230 415 Austria  
 A | 3 | 2




Listed ind. cont. EQ 93B2  
 **us** 600v ac 10amp  
 A600 O600

Photo:

K3-40 represents all other Brands and Types



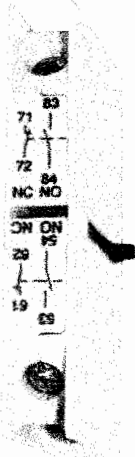
HN represents all other Brands and Types



HA represents all other Brands and Types



HB represents all other Brands and Types



## Test item particulars:

- method of operation ..... : Magnetic
- switching positions ..... : ON-OFF
- number of poles ..... : 3 Main
- kind of current..... : AC
- number of phases..... : 3
- rated frequency (Hz)..... : 50-60
- number of positions of main contacts..... : 2

## Rated and limiting values, main circuit..... :

- rated operational voltage  $U_e$  (V) ..... : 690
- rated insulation voltage  $U_i$  (V) ..... : 690
- rated impulse withstand voltage  $U_{imp}$  (kV)..... : 8
- conventional free air thermal current  $I_{th}$  (A)..... : 50      65      80
- conventional enclosed thermal current  $I_{the}$  (A) ..... : -
- rated operational current  $I_e$  (A) ..... : 50      65      80
- rated uninterrupted  $I_u$  (A) ..... : 50      65      80
- utilization category..... : AC1

## Short-circuit characteristic ..... :

- rated prospective short-circuit current "r" (kA) ..... : 10
- rated conditional short-circuit current  $I_q$  (kA) ..... : 10

## Rated and limiting values, auxiliary circuits..... :

- rated operational voltage (V)..... : 690
- rated frequency (Hz)..... : 50-60
- number of circuits ..... : -
- number and kind of contact elements ..... : -

## Co-ordination of short-circuit protective devices ..... : Type "1"

- kind of protective device..... : Fuse 100A gL/gG or circuit breaker

## Possible test case verdicts:

- test case does not apply to the test object ..... : N(.A.)
- test object does meet the requirement..... : P(ass)
- test object does not meet the requirement..... : F(ail)

**General remarks:**

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IEC 60947-4-1/A1:2002-09.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

1. **The contactors K3-24/32/40... are covered in CB-AT 1285**
2. **The auxiliary contact blocks HN... and HA... are covered in CB-AT1061.**
3. **The auxiliary contact block HB... is covered in CB-AT 1299.**
4. **All operational performance capability tests have been performed with K3-24 (= smallest size) contactors with ratings of K3-40 (=biggest size) contactors.**
5. **All mechanical (mirror contacts) tests are performed with K3-40 contactors based on the smallest contact gaps at this device.**
6. **This report was modified to cover the requirements of ANNEX F of IEC 60947-4-1/A1:2002-09, all other items have been deleted.**

**Ordering key:****Contactor**

K3-24xxx ... see CB-AT 1285

**Auxiliary Contact Block**

HNxxx ... see CB-AT 1061

HAxxx ... see CB-AT 1061

HBxxx ... see CB-AT 1299

| IEC 60 947-4-1 |  |                 |         |
|----------------|--|-----------------|---------|
| Clause         | Requirement – Test                               | Result - Remark | Verdict |
| F.4            | Mirror contacts shall be clearly identified:     |                 | P       |
|                | - on the contactor                               | ---             | N       |
|                | - in the manufacturer documentation              | P               | P       |
|                | Correct symbol used                              | P               | P       |
| F.7.4          | Test for mirror contacts                         | K3-40 + HN      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |
| or b2)         | Contact gap (mm) – requirret 0,5mm .....         | ---             |         |
|                | Designation of tested mirror contact .....       | 21-22           | P       |
|                | Designation of tested mirror contact .....       | 11-12           | P       |
|                | Designation of tested mirror contact .....       | 31-32           | P       |
|                | Designation of tested mirror contact .....       | 41-42           | P       |
|                | Designation of tested mirror contact .....       | 51-52           | P       |
| F.7.4          | Test for mirror contacts                         | K3-40 + HA      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |
| or b2)         | Contact gap (mm) – requirret 0,5mm .....         | ---             |         |
|                | Designation of tested mirror contact .....       | 21-22           | P       |
|                | Designation of tested mirror contact .....       | 11-12           | P       |
|                | Designation of tested mirror contact .....       | 31-32           | P       |
|                | Designation of tested mirror contact .....       | 41-42           | P       |
|                | Designation of tested mirror contact .....       | 51-52           | P       |
| F.7.4          | Test for mirror contacts                         | K3-40 + HB      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |

| IEC 60 947-4-1 |  |  |         |
|----------------|--|--|---------|
| Clause         | Requirement – Test   | Result - Remark                                  | Verdict |
| or b2)         | Contact gap (mm) – requiret 0,5mm.....:  | ---  |         |
|                | Designation of tested mirror contact .....   | 61-62 (mounted on right side)                    | P       |
|                | Designation of tested mirror contact .....   | 71-72 (mounted on left side)                     | P       |
| F.7.4.2        | Test after conventional operational performance :  | K3-24 +HA + HN +HB                               | P       |
|                | utilization category .....   | AC1  | —       |
|                | rated operational voltage (V) .....  | 690  | —       |
|                | rated operational current Ie (A) or power (kW) ..:   | 80   | —       |
|                | Test conditions for make/break operations AC-1 only:   |  | P       |
|                | test voltage (V) .....   | L1: 728 (required: 725 V)<br>L2: 728<br>L3: 728  | —       |
|                | test current (A) .....   | L1: 82<br>L2: 82<br>L3: 82                       | —       |
|                | power factor/time constant .....   | L1: 0,84 (required: 0,8)<br>L2: 0,84<br>L3: 0,84 | —       |
|                | - on-time (ms) .....   | 200  | —       |
|                | - off-time (s) .....   | 4  | —       |
|                | - number of operating cycles .....   | 6000   | P       |
| 9.3.3.6.6      | Behaviour and condition during and after the test:   |  | P       |
|                | - no permanent arcing  | P  | P       |
|                | - no flash-over between poles  | P  | P       |
|                | - no blowing of the fusible element in the earth circuit   | P  | P       |
|                | - no welding of the contacts   | P  | P       |
|                | - the contacts shall operate when the contactor or starter is switched by the applicable method of control | P  | P       |
|                | Dielectric verification :  |  | P       |
|                | test voltage (V) .....   | 2,5kV (required: 690V)                           | P       |



| <b>TEST REPORT</b><br><b>IEC 60 947-4-1</b><br><b>Low-voltage switchgear and controlgear</b><br><b>Part 4: Contactors and motor-starters</b><br><b>Section 1: Electromechanical contactors and motor-starters</b> |   |
|---|---|
| Report reference No. :  | CTI – PA 1824-4   |
| Tested by (+ signature) .....   | Ing. H. Hausl   |
| Approved by (+ signature) .....   | J. Wolf   |
| Date of issue .....   | 14.08.2003  |
| Testing laboratory .....  | CTI-Vienna  |
| Address .....   | A – 1210 Vienna, Einzingerasse 4  |
| Testing location .....  | as above  |
| Applicant .....   | Benedikt GmbH   |
| Address .....   | A – 1220 Vienna, Liebigasse 7   |
| Standard .....  | IEC 60 947-4-1:2000-11 + A1:2002-09   |
| Test Report Form No. ....   | 69474-1A modified   |
| Master TRF .....  | reference No. 69474-1A, dated 95-07   |
| Copyright blank test report .....   | the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). |
| Test procedure .....  | STR   |
| Procedure deviation .....   | only requirements according to ANNEX F have been tested   |
| Non-standard test method .....  | N.A.  |
| Type of test object .....   | Contactors (K3) and optionally used Auxiliary Contact Blocks (H)  |
| Trademark .....   | Ω, Benedikt & Jäger   |
| Model/type reference .....  | K3-50..., K3-62..., K3-74...,<br>HN..., HA..., HB...  |
| Manufacturer .....  | Ω Benedikt & Jäger  |
| Rating .....  | 110A, 120A, 130A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz)   |

|                           |   |
|---------------------------|---|
| Further Trademark .....   | SCHRACK   |
| Model/type reference..... | LA3050..., LA3062..., LA3074...,<br>HN..., HA..., HB...         |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 110A, 120A, 120A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz) |

|                           |   |
|---------------------------|---|
| Further Trademark .....   | IMO   |
| Model/type reference..... | MC50-S..., MC62-S..., MC74-S...,<br>MCA-..., MCAH-..., MCAS-... |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 110A, 120A, 130A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz) |

|                           |   |
|---------------------------|---|
| Further Trademark .....   | OMRON   |
| Model/type reference..... | 7JKN-50..., 7JKN-62..., 7JKN-74...,<br>7J3KN-B-..., J73KN-BA-..., J73KN-C-... |
| Manufacturer .....        | Ω Benedikt & Jäger  |
| Rating .....              | 110A, 120A, 130A (690V 50-60Hz)<br>10A, 25A, 10A (690V 50-60Hz)               |

Copy of marking plate (B&J represents all other Brands)

Contactor

K3-50

K3-62

K3-74

**AC3 400V~ 50A**

IEC/EN60947-4-1 VDE0660  
AC1 = I<sub>th</sub> 110A 690V~

|          |      |      |     |     |     |     |
|----------|------|------|-----|-----|-----|-----|
| AC2, AC3 | 220  | 230  | 240 | 400 | 440 | 500 |
| V~       | 230  | 240  | 400 | 440 | 690 |     |
| kW       | 12,5 | 13,5 | 22  | 24  | 30  |     |

Made in Austria

LISTED IND. 600v ac  
CONT. EQ. 93B2 110amp

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| hp 3ph    | 10  | 15  | 20  | 30  | 40  |
| hp 1ph 2p | 3   | 7,5 | 10  | 20  | 25  |

**A1** **A2**

SUITABLE FOR USE ON A CIRCUIT OF DELIVERING 5000RMS SYM. AMP. 600 VOLTS AC MAXIMUM. MAX. FUSE SIZE 175 AMP. WIRE 60/75°C Cu ONLY. TIGHT TORQUE 45 lb.-in. 12AWG - 0AWG

**AC3 400V~ 62A**

IEC/EN60947-4-1 VDE0660  
AC1 = I<sub>th</sub> 120A 690V~

|          |      |     |     |     |     |     |
|----------|------|-----|-----|-----|-----|-----|
| AC2, AC3 | 220  | 230 | 240 | 400 | 440 | 500 |
| V~       | 230  | 240 | 400 | 440 | 690 |     |
| kW       | 18,5 | 19  | 30  | 33  | 37  |     |

Made in Austria

LISTED IND. 600v ac  
CONT. EQ. 93B2 120amp

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| hp 3ph    | 10  | 20  | 25  | 40  | 50  |
| hp 1ph 2p | 5   | 10  | 15  | 25  | 30  |

**A1** **A2**

SUITABLE FOR USE ON A CIRCUIT OF DELIVERING 5000RMS SYM. AMP. 600 VOLTS AC MAXIMUM. MAX. FUSE SIZE 225 AMP. WIRE 60/75°C Cu ONLY. TIGHT TORQUE 45 lb.-in. 12AWG - 0AWG

**AC3 400V~ 74A**

IEC/EN60947-4-1 VDE0660  
AC1 = I<sub>th</sub> 130A 690V~

|          |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|
| AC2, AC3 | 220 | 230 | 240 | 400 | 440 | 500 |
| V~       | 230 | 240 | 400 | 440 | 690 |     |
| kW       | 22  | 23  | 37  | 40  | 45  |     |

Made in Austria

LISTED IND. 600v ac  
CONT. EQ. 93B2 130amp

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| v         | 115 | 200 | 230 | 460 | 575 |
| hp 3ph    | 10  | 25  | 30  | 50  | 50  |
| hp 1ph 2p | 7,5 | 15  | 15  | 25  | 30  |

**A1** **A2**

SUITABLE FOR USE ON A CIRCUIT OF DELIVERING 5000RMS SYM. AMP. 600 VOLTS AC MAXIMUM. MAX. FUSE SIZE 250 AMP. WIRE 60/75°C Cu ONLY. TIGHT TORQUE 45 lb.-in. 12AWG - 0AWG

Auxiliary Contact Block

**HN**

IEC/EN60947-5-1 VDE0660  
AC1 10A 690V~

|         |     |     |     |     |
|---------|-----|-----|-----|-----|
| AC15 V~ | 230 | 400 | 500 | 690 |
| A       | 3   | 2   | 1,2 | 0,5 |

Made in Austria

**BENEDIKT & JÄGER HN10**

LISTED IND. CONT. EQ. 93B3 A600

To be used with series K/LA contactors | WZ19

**HA**

IEC/EN60947-5-1 VDE0660  
AC1 25A 690V~

|         |     |     |     |     |
|---------|-----|-----|-----|-----|
| AC15 V~ | 230 | 400 | 500 | 690 |
| A       | 6   | 3   | 2   | 1   |

Made in Austria

LISTED IND. CONT. EQ. 93B3 A600

To be used with contactors

**HB**

IEC/EN60947-5-1 VDE0660  
AC1 = I<sub>th</sub> 690V~ 10A

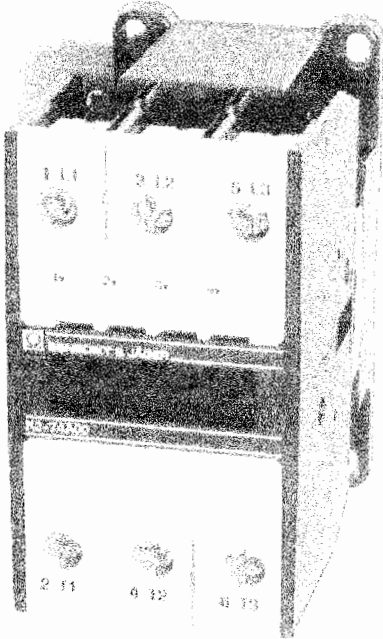
|      |      |     |         |
|------|------|-----|---------|
| AC15 | 1220 | 380 | Made in |
| V~   | 230  | 415 | Austria |
| A    | 1    | 3   | 2       |

Listed ind. cont. EQ 93B2 600v ac 10amp

LISTED IND. CONT. EQ. 93B2 A600

Photo:

K3-74 represents all other Brands and Types



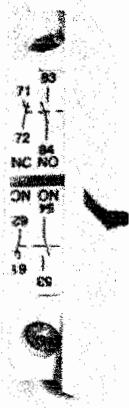
HN represents all other Brands and Types



HA represents all other Brands and Types



HB represents all other Brands and Types



## Test item particulars:

- method of operation ..... : Magnetic
- switching positions ..... : ON-OFF
- number of poles ..... : 3 Main
- kind of current ..... : AC
- number of phases ..... : 3
- rated frequency (Hz) ..... : 50-60
- number of positions of main contacts ..... : 2

## Rated and limiting values, main circuit ..... :

- rated operational voltage  $U_e$  (V) ..... : 690
- rated insulation voltage  $U_i$  (V) ..... : 690
- rated impulse withstand voltage  $U_{imp}$  (kV) ..... : 8
- conventional free air thermal current  $I_{th}$  (A) ..... : 120    130    130
- conventional enclosed thermal current  $I_{the}$  (A) ..... : -
- rated operational current  $I_e$  (A) ..... : 120    130    130
- rated uninterrupted  $I_u$  (A) ..... : 120    130    130
- utilization category ..... : AC1

## Short-circuit characteristic ..... :

- rated prospective short-circuit current "r" (kA) ..... : 10
- rated conditional short-circuit current  $I_q$  (kA) ..... : 10

## Rated and limiting values, auxiliary circuits ..... :

- rated operational voltage (V) ..... : 690
- rated frequency (Hz) ..... : 50-60
- number of circuits ..... : -
- number and kind of contact elements ..... : -

## Co-ordination of short-circuit protective devices ..... : Type "1"

- kind of protective device ..... : Fuse 160A gL/gG or circuit breaker

## Possible test case verdicts:

- test case does not apply to the test object ..... : N(.A.)
- test object does meet the requirement ..... : P(ass)
- test object does not meet the requirement ..... : F(ail)

## General remarks:

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IEC 60947-4-1/A1:2002-09.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

1. **The contactors K3-50/62/74... are covered in CB-AT 1285**
2. **The auxiliary contact blocks HN... and HA... are covered in CB-AT 1061.**
3. **The auxiliary contact block HB... is covered in CB-AT 1299.**
4. **All operational performance capability tests have been performed with K3-50 (= smallest size) contactors with ratings of K3-74 (=biggest size) contactors.**
5. **All mechanical (mirror contacts) tests are performed with K3-74 contactors based on the smallest contact gaps at this device.**
6. **This report was modified to cover the requirements of ANNEX F of IEC 60947-4-1/A1:2002-09, all other items have been deleted.**

## Ordering key:

## Contactor

K3-50xxx ... see CB-AT 1285

## Auxiliary Contact Block

HNxxx ... see CB-AT 1061

HAxxx ... see CB-AT 1061

HBxxx ... see CB-AT 1299

| IEC 60 947-4-1 |  |                 |         |
|----------------|--|-----------------|---------|
| Clause         | Requirement – Test                               | Result - Remark | Verdict |
| F.4            | Mirror contacts shall be clearly identified:     |                 | P       |
|                | - on the contactor                               | ---             | N       |
|                | - in the manufacturer documentation              | P               | P       |
|                | Correct symbol used                              | P               | P       |
| F.7.4          | Test for mirror contacts                         | K3-74 + HN      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |
| or b2)         | Contact gap (mm) – requirret 0,5mm .....         | ---             |         |
|                | Designation of tested mirror contact .....       | 21-22           | P       |
|                | Designation of tested mirror contact .....       | 11-12           | P       |
|                | Designation of tested mirror contact .....       | 31-32           | P       |
|                | Designation of tested mirror contact .....       | 41-42           | P       |
|                | Designation of tested mirror contact .....       | 51-52           | P       |
| F.7.4          | Test for mirror contacts                         | K3-74 + HA      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |
| or b2)         | Contact gap (mm) – requirret 0,5mm .....         | ---             |         |
|                | Designation of tested mirror contact .....       | 21-22           | P       |
|                | Designation of tested mirror contact .....       | 11-12           | P       |
|                | Designation of tested mirror contact .....       | 31-32           | P       |
|                | Designation of tested mirror contact .....       | 41-42           | P       |
|                | Designation of tested mirror contact .....       | 51-52           | P       |
| F.7.4          | Test for mirror contacts                         | K3-74 + HB      | P       |
| F.7.4.1        | Tests on products in a new condition             |                 | P       |
| a)             | Designation of welded main pole .....            | 1(L1) – 1 (T1)  |         |
|                | Methode used .....                               | soldering       |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV ..... | 2,5             |         |

| IEC 60 947-4-1 |  |  |         |
|----------------|--|--|---------|
| Clause         | Requirement – Test   | Result - Remark                                  | Verdict |
| or b2)         | Contact gap (mm) – requiret 0,5mm.....:  | ---  |         |
|                | Designation of tested mirror contact .....   | 61-62 (mounted on right side)                    | P       |
|                | Designation of tested mirror contact .....   | 71-72 (mounted on left side)                     | P       |
| F.7.4.2        | Test after conventional operational performance :  | K3-50 +HA + HN +HB                               | P       |
|                | utilization category .....   | AC1  | —       |
|                | rated operational voltage (V) .....  | 690  | —       |
|                | rated operational current Ie (A) or power (kW) ..:   | 130  | —       |
|                | Test conditions for make/break operations AC-1 only:   |  | P       |
|                | test voltage (V) .....   | L1: 727 (required: 725 V)<br>L2: 727<br>L3: 727  | —       |
|                | test current (A) .....   | L1: 134<br>L2: 134<br>L3: 134                    | —       |
|                | power factor/time constant .....   | L1: 0,79 (required: 0,8)<br>L2: 0,79<br>L3: 0,79 | —       |
|                | - on-time (ms) .....   | 200  | —       |
|                | - off-time (s) .....   | 4  | —       |
|                | - number of operating cycles .....   | 6000   | P       |
| 9.3.3.6.6      | Behaviour and condition during and after the test:   |  | P       |
|                | - no permanent arcing  | P  | P       |
|                | - no flash-over between poles  | P  | P       |
|                | - no blowing of the fusible element in the earth circuit   | P  | P       |
|                | - no welding of the contacts   | P  | P       |
|                | - the contacts shall operate when the contactor or starter is switched by the applicable method of control | P  | P       |
|                | Dielectric verification :  |  | P       |
|                | test voltage (V) .....   | 2,5kV (required: 690V)                           | P       |



| <b>TEST REPORT</b><br><b>IEC 60 947-4-1</b><br><b>Low-voltage switchgear and controlgear</b><br><b>Part 4: Contactors and motor-starters</b><br><b>Section 1: Electromechanical contactors and motor-starters</b> |   |
|---|---|
| Report reference No. :  | CTI – PA 1824-5   |
| Tested by (+ signature) .....   | Ing. H. Hausl                          |
| Approved by (+ signature) .....   | J. Wolf                                |
| Date of issue .....   | 14.08.2003  |
| Testing laboratory .....  | CTI-Vienna  |
| Address .....   | A – 1210 Vienna, Einzingerasse 4  |
| Testing location .....  | as above  |
| Applicant .....   | Benedikt GmbH   |
| Address .....   | A – 1220 Vienna, Lieblgasse 7   |
| Standard .....  | IEC 60 947-4-1:2000-11 + A1:2002-09   |
| Test Report Form No. ....   | 69474-1A modified   |
| Master TRF .....  | reference No. 69474-1A, dated 95-07   |
| Copyright blank test report .....   | the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). |
| Test procedure .....  | STR   |
| Procedure deviation .....   | only requirements according to ANNEX F have been tested   |
| Non-standard test method .....  | N.A.  |
| Type of test object .....   | Contactors (K3)   |
| Trademark .....   | Ω, Benedikt & Jäger   |
| Model/type reference .....  | K85..., K110...,  |
| Manufacturer .....  | Ω Benedikt & Jäger  |
| Rating .....  | 150A, 170A (690V 50-60Hz)   |

|                           |                           |
|---------------------------|---------------------------|
| Further Trademark .....   | SCHRACK                   |
| Model/type reference..... | K85..., K110...           |
| Manufacturer .....        | Ω Benedikt & Jäger        |
| Rating .....              | 150A, 170A (690V 50-60Hz) |

|                           |                           |
|---------------------------|---------------------------|
| Further Trademark .....   | IMO                       |
| Model/type reference..... | K85...- K110...           |
| Manufacturer .....        | Ω Benedikt & Jäger        |
| Rating .....              | 150A, 170A (690V 50-60Hz) |

|                           |                           |
|---------------------------|---------------------------|
| Further Trademark .....   | OMRON                     |
| Model/type reference..... | 7JKN-85..., 7JKN-110      |
| Manufacturer .....        | Ω Benedikt & Jäger        |
| Rating .....              | 150A, 170A (690V 50-60Hz) |

Copy of marking plate (B&J represents all other Brands)

Contactor

1 L1                      3 L2                      5 L3



**K85**

IEC:EN60947-4-1  
VDE0660

|  |      |
|--|------|
| AC1 I <sub>n</sub> 150A U <sub>i</sub> 850V~ |      |
| AC2, AC3                                     |      |
| 220 - 230V~                                  | 25kW |
| 240V~  | 27kW |
| 380 - 400V~                                  | 45kW |
| 415 - 440V~                                  | 49kW |
| 500V~  | 55kW |
| 660 - 690V~                                  | 55kW |

Made in Austria

WIRE 75°C Cu ONLY  
TIGHTENING TORQUE 162 lb.-in.  
3 AWG - 0 AWG SINGLE  
SUITABLE FOR USE ON A CIRCUIT  
CAPABLE OF DELIVERING NOT  
MORE THAN 10000 RMS  
SYMMETRICAL AMPERES,  
600 VOLTS MAXIMUM  
WHEN PROTECTED BY A  
FUSE RATED 300 AMP.

LISTED IND. CONT. EQ. 93B2

|                 | Motor load |        |
|-----------------|------------|--------|
|                 | 3ph ac     | 1ph ac |
| 115 v           | 15 hp      | 8 hp   |
| 230 v           | 35 hp      | 20 hp  |
| 460 v           | 65 hp      | -      |
| 575 v           | 85 hp      | -      |
| 600v            | 125 amp    |        |
| Aux. cont. A600 |            |        |

K85

2 T1                      4 T2                      6 T3

1 L1                      3 L2                      5 L3



**K110**

IEC:EN60947-4-1  
VDE0660

|  |      |
|--|------|
| AC1 I <sub>n</sub> 170A U <sub>i</sub> 850V~ |      |
| AC2, AC3                                     |      |
| 220 - 230V~                                  | 33kW |
| 240V~  | 35kW |
| 380 - 400V~                                  | 55kW |
| 415 - 440V~                                  | 63kW |
| 500V~  | 75kW |
| 660 - 690V~                                  | 55kW |

Made in Austria

WIRE 75°C Cu ONLY  
TIGHTENING TORQUE 162 lb.-in.  
3 AWG - 0 AWG SINGLE  
SUITABLE FOR USE ON A CIRCUIT  
CAPABLE OF DELIVERING NOT  
MORE THAN 10000 RMS  
SYMMETRICAL AMPERES,  
600 VOLTS MAXIMUM  
WHEN PROTECTED BY A  
FUSE RATED 300 AMP.

LISTED IND. CONT. EQ. 93B2

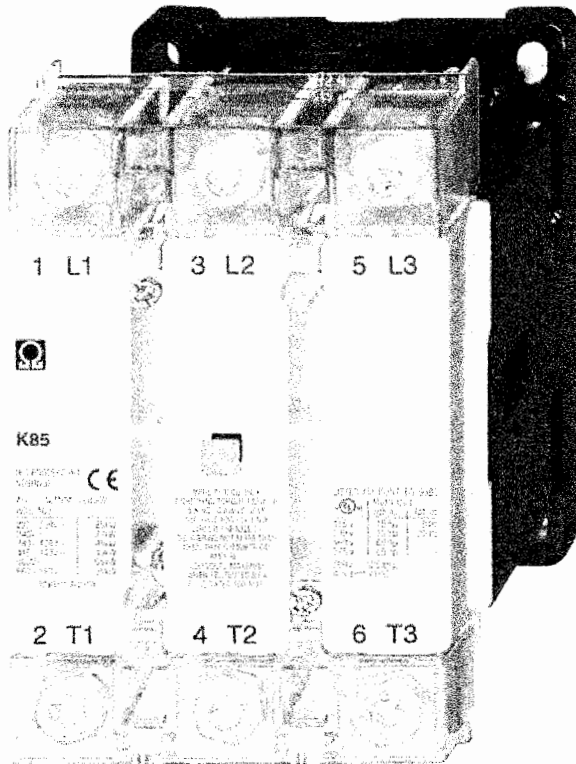
|                 | Motor load |        |
|-----------------|------------|--------|
|                 | 3ph ac     | 1ph ac |
| 115 v           | -          | 10 hp  |
| 200 v           | 30 hp      | 20 hp  |
| 230 v           | 40 hp      | 20 hp  |
| 460 v           | 75 hp      | -      |
| 575 v           | 100 hp     | -      |
| 600v            | 125 amp    |        |
| Aux. cont. A600 |            |        |

K110

2 T1                      4 T2                      6 T3

Photo:

K85 represents all other Brands and Types



Test item particulars:

- method of operation ..... : Magnetic
- switching positions ..... : ON-OFF
- number of poles..... : 3 Main + 3 to 4 Auxilliary
- kind of current..... : AC
- number of phases..... : 3
- rated frequency (Hz)..... : 50-60
- number of positions of main contacts..... : 2

Rated and limiting values, main circuit..... :

- rated operational voltage  $U_e$  (V) ..... : 690
- rated insulation voltage  $U_i$  (V) ..... : 690
- rated impulse withstand voltage  $U_{imp}$  (kV)..... : 8
- conventional free air thermal current  $I_{th}$  (A)..... : 150    170
- conventional enclosed thermal current  $I_{the}$  (A) ..... : -
- rated operational current  $I_e$  (A) ..... : 150    170
- rated uninterrupted  $I_u$  (A) ..... : 150    170
- utilization category..... : AC1

Short-circuit characteristic ..... :

- rated prospective short-circuit current "r" (kA) ..... : 10
- rated conditional short-circuit current  $I_q$  (kA) ..... : 10

Rated and limiting values, auxiliary circuits..... :

- rated operational voltage (V)..... : 690
- rated frequency (Hz)..... : 50-60
- number of circuits ..... : -
- number and kind of contact elements ..... : -

Co-ordination of short-circuit protective devices ..... : Type "1"

- kind of protective device ..... : Fuse 250A gL/gG

Possible test case verdicts:

- test case does not apply to the test object..... : N(.A.)
- test object does meet the requirement..... : P(ass)
- test object does not meet the requirement..... : F(ail)

**General remarks:**

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

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- 1. The Contactors K85/110... are covered in CB-AT 1059**
- 2. All operational performance capability tests have been performed with K85 (= smallest size) contactors with ratings of K110 (=biggest size) contactors.**
- 3. All mechanical (mirror contacts) tests are performed with K110 contactors based on the smallest contact gaps at this device.**
- 4. This report was modified to cover the requirements of ANNEX F of IEC 60947-4-1/A1:2002-09, all other items have been deleted.**

**Ordering key:**

Contactors

K85xxx ... see CB-AT 1095

| IEC 60 947-4-1 |  |  |         |
|----------------|--|--|---------|
| Clause         | Requirement – Test                                   | Result - Remark                                  | Verdict |
| F.4            | Mirror contacts shall be clearly identified:         |  | P       |
|                | - on the contactor                                   | ---  | N       |
|                | - in the manufacturer documentation                  | P  | P       |
|                | Correct symbol used                                  | P  | P       |
| F.7.4          | Test for mirror contacts                             | K110A22  | P       |
| F.7.4.1        | Tests on products in a new condition                 |  | P       |
| a)             | Designation of welded main pole .....                | 1(L1) – 1 (T1)                                   |         |
|                | Method used .....                                    | soldering  |         |
| b1)            | Impulse test voltage (kV) – required 2,5kV .....     | 2,5  |         |
| or b2)         | Contact gap (mm) – requiret 0,5mm .....              | ---  |         |
|                | Designation of tested mirror contact .....           | 21-22  | P       |
|                | Designation of tested mirror contact .....           | 31-32  | P       |
| F.7.4.2        | Test after conventional operational performance :    | K85  | P       |
|                | utilization category .....                           | AC1  | —       |
|                | rated operational voltage (V) .....                  | 690  | —       |
|                | rated operational current Ie (A) or power (kW) ..:   | 170  | —       |
|                | Test conditions for make/break operations AC-1 only: |  | P       |
|                | test voltage (V) .....                               | L1: 730 (required: 725 V)<br>L2: 730<br>L3: 730  | —       |
|                | test current (A) .....                               | L1: 176<br>L2: 176<br>L3: 176                    | —       |
|                | power factor/time constant .....                     | L1: 0,82 (required: 0,8)<br>L2: 0,82<br>L3: 0,82 | —       |
|                | - on-time (ms) .....                                 | 200  | —       |
|                | - off-time (s) .....                                 | 4  | —       |
|                | - number of operating cycles .....                   | 6000   | P       |
| 9.3.3.6.6      | Behaviour and condition during and after the test:   |  | P       |
|                | - no permanent arcing                                | P  | P       |
|                | - no flash-over between poles                        | P  | P       |