

SIEMENS

Prüf-Nr./Q-Nr.: 1275a
Certificate No.:
Dienststelle: TZA/Müller
Department:
Ort: Amberg Tag: 04.03.1991
Place: Date:

Anlagen:
Enclosures: 2 Test Report (10 sheets)

Prüfbescheinigung/ Test-Certificate

Erzeugnis/Product

Contactor Relay

Typ: 3TH4./3TH8.
Type:

Auftr.-Nr./Bz-Nr.: --
Internal Order-No.:

Hersteller: SIEMENS AG,
Manufacturer: Gerätewerk Amberg

Fabr.-Nr.: --
Factory-Serial-No.:

Kunden-Nr.: --
Customer's Ref.-No.:

Kunde/Kennwort: --
Order code word:

Werk-Nr.: --
Works No.:

Techn. Daten: Test for Verification of the secureness to
Specification: induced vibrations

Art der Prüfung/Type of test

Vibration test

Prüfer/Tested by: H. Bayer/H. Moser Tag der Prüfung/Date of test: 3/1984 and 2/1991

Prüfort/Test site: E STE 139 Erlangen Verwendete Prüfeinrichtung/Test equipment: Vibration generator

Angewandte Prüfbestimmungen/Test specifications applied:

SIEMENS ZEN 000 DD/7080.9/1 (Draft 1987)

DIN IEC 68 Part 2-6/02.84

DIN IEC 68 Part 2-47/06.85

Durchgeführte Prüfungen/Test conducted:

- Resonance search: sliding sine 5 to 35 Hz; 2 m/s²; 1 octave/min;
- Loading: sliding sine 4,5 to 35 to 4,5 Hz; 1 octave/min;
- Additional loading a₀
- Function test of contacts during loading;
- Repeat-routine-test after loading;

Prüfergebnis/Test results:

Resonance frequencies were found with Types 3TH43/83 with dc-operating system at 33 Hz in x-axis only. The devices met the applied specifications. No malfunction occurred during the function test up to 84 m/s² with the devices with ac-operating system and up to 31 m/s² wire devices with dc-operating system. The repeat routine test in accordance to DIN VDE 0660 Part 203 was passed. See to the enclosure for details.

Bemerkungen/Remarks:

This certificate applies to the contactor relays Type 3TH40, -42 and -43 and 3TH80, -82 and -83 with ac- and dc-operating system.

Translation of the German original with No. 0207a dated 14.02.91.

Geprüft/Tested by:

Gegengezeichnet/Released by:

SIEMENS AKTIENGESELLSCHAFT Power Engineering and Automation Group

Chairman of the Supervisory Board: Heribald Näger · Managing Board: Karlheinz Kaske, Chairman · Members: Klaus Barthelt, Karl-Hermann Baumann, Hans Baur, Gerhard Börnecke, Hans-Günter Danielmayer, Hermann Franz, Erwin N. Hardt, Hans Hirschmann, Wolfgang Keller, Claus Kessler, Eberhard Kill, Jürgen Knorr, Gerhard Loh, Hubert Langer, Werner Maly, Hans-Gerd Naglein, Anton Preisl, Heinrich von Pierer, Peter von Siemens, Carl-Heiner Thomas
Registered Offices: Berlin and Munich · Registered at: Berlin-Charlottenburg, HRB 12300; Munich, HRB 6684

Test report

Department E STE 139	Location Erlangen	Sheet/enclosures 1	Date 24.09.1984
Compiled by: Bayer	Telephone 5628	Released by: Bayer	Reference EST 139/84.0302
Distributor GWA/TZA Mr. Müller E STE 139	Date of test: March 7 to 20, 1984		

VIBRATION TEST TO VERIFY THE RELAY'S RESISTANCE TO INDUCED
VIBRATIONS DUE TO EARTHQUAKE AND SIMILAR CASES OF LOADING

1. Test specimen

Contactory Relay : Type 3TH8244-0AM0 screw mounted
Manufacturer : SIEMENS AG

The test specimen was not checked against the drawings, particularly with regard to dimensions, built-in items and materials used.

2. Test specifications applied

KWU AVS DD/7080.9 dated July 5, 83
DIN 40046, part 8
DIN IEC 50 A.141

Test report	Date	Reference	Sheet/Enclosures
E STE 139/ 84.0302-6	24.09.1984	E STE 139/ 84.0302	2

3. Test equipment

Electrodynamic vibration generator for simulation of movement in one axis:

Vibrator	: Ling Dynamics Systems Model 805	X
Amplifier	: Ling Dynamics Systems MPA 8	X
Signal compressor	: Ling Dynamics Systems SCO 200	X
Resonance dwell unit	: Ling Dynamics Systems RD 200	-

4. Measuring devices

Acceleration recorder	: Brüel & Kjaer (Triax.) 4321	-
	Brüel & Kjaer 4370	X
	Endevco 2252	X
Charge amplifier	: Brüel & Kjaer 2626	X
	Brüel & Kjaer 2635	-
Overtravel filter	: Brüel & Kjaer 1623	X
Control signal selector	: Brüel & Kjaer 5686 max. 6 measuring points	X

5. Calibration equipment

Calibrator for vibration recorder	: Brüel & Kjaer 4291 50 Hz to 2 kHz Calibration level: 9.81 m/s ²	X
Standard recorder reference	: Brüel & Kjaer 8305	X

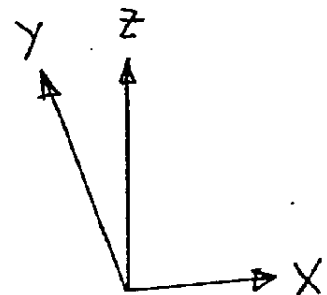
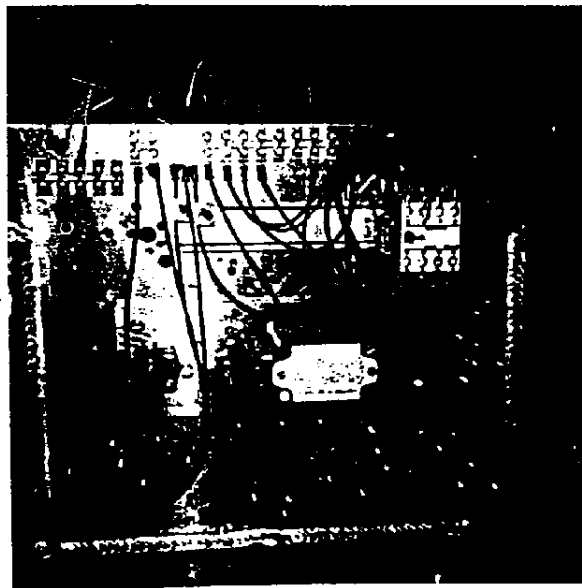
Test report	Date	Reference	Sheet/Enclosures
E STE 139/ 84.0302-6	24.09.1984	E STE 139/ 85.0362-2	3

6. Recording equipment

X-Y recorder	: Brüel & Kjaer	2308	X
Light beam oscillograph	: Siemens Oscillofil		X
Stroboscope	: Brüel & Kjaer	4911C	X
Spectrum analyzer	: Hewlett Packard 0.02 Hz to 25.5 kHz	3582	X
Transient recorder	: Siemens AG 0 Hz to 400 kHz 2 channels	D1101	-

7. Test setup:

3TH8244 -



Test report
E STE 139/
84.0302-6

Date
24.09.1984

Reference
E STE 139/
84.0302 2

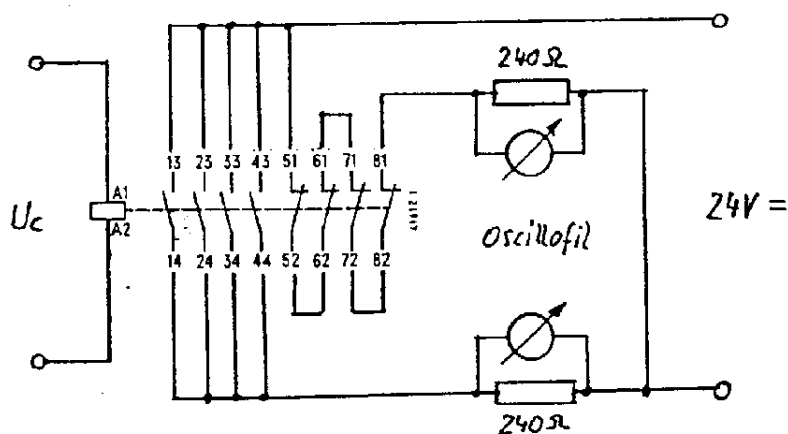
Sheet/Enclosures
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8. Designation of the axial directions (= measuring directions)

see to sheet No. 3

9. Circuit for function test

OFF-Position:



ON-Position: NO-contacts in series, NC-contacts parallell.

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E STE 139/ 84.0302-6	24.09.1984	E STE 139/ 84.0302	5

11. Tests carried out

In the 3 main axes:

- Resonance search with slide sine 0.2g; 5 to 35 Hz;
1 octave/min
- Loading with slide sine (raising factor 1,4):
5 ... 35 ... 5 Hz, 1 octave /min.
5 ... 7,5 Hz: +/- 10 mm
7,5...35 Hz: 2,1 ... 0,91 g in steps.
- Additional Loading with 8,4 g (raising factor 1,4):
with 78 Hz (in Y-Direction, OFF)
25 Hz (general)
- Function test and monitoring of the contacts during loading
in energized state ($0,7 \times U_e$), off-state and in action ($0,75 \times U_c$).
- Function test after the loading

12. Test results

- Natural frequencies: none in test range of 5 to 35 Hz
- The test specimens withstood the loading successfully.
During the function test no maloperation exceeding the
permissible tolerances occurred.

Test report No. TZS / 91 / 527

Department	Location	Sheet/enclosures	Date
ASI GWA TZS	Amberg	1+	04.03.1991

Compiled by:	Telephone	Released by:	Test date
Moser	09621 80 2431	Moser	04.02.1991

VIBRATION TEST TO VERIFY THE RELAY'S RESISTANCE TO INDUCED
VIBRATIONS DUE TO EARTHQUAKE AND SIMILAR CASES OF LOADING

1. Test specimen

Contacting Relay : Type 3TH40..-0B
3TH42..-0B
3TH43..-0B
3TH80..-0B
3TH82..-0B
3TH83..-0B

Manufacturer : SIEMENS AG

Quantity of specimens : 1

Additional marks : Snap-on and screw mounting

2. Test specifications applied

SIEMENS ZEN 00 DD/7080.9/1 (Draft 1987)
DIN IEC 68 Part 2-6/02.84
DIN IEC 68 Part 2-47/06.85

3. Test equipment

Electrodynamic vibration generator for simulation of movement
in one axis:

Vibrator : RMS SW 8200

Amplifier : RMS TGA 12000

Resonance dwell unit : RMS SWR 600 with calculator
Amstrad PC 1512 SD

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TZS/91/527

Date
04.02.1991

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4. Measuring devices

Acceleration recorder	:	Brüel & Kjaer 4367
		Brüel & Kjaer 4369
		Brüel & Kjaer 4375
Charge amplifier	:	RMS SWE 379
Overtravel filter	:	RMS SWR600-8
Calculator	:	Amstrad PC 1512 SD

5. Calibration equipment

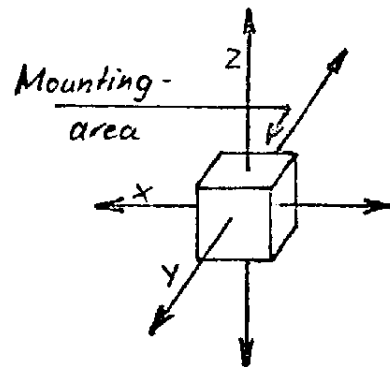
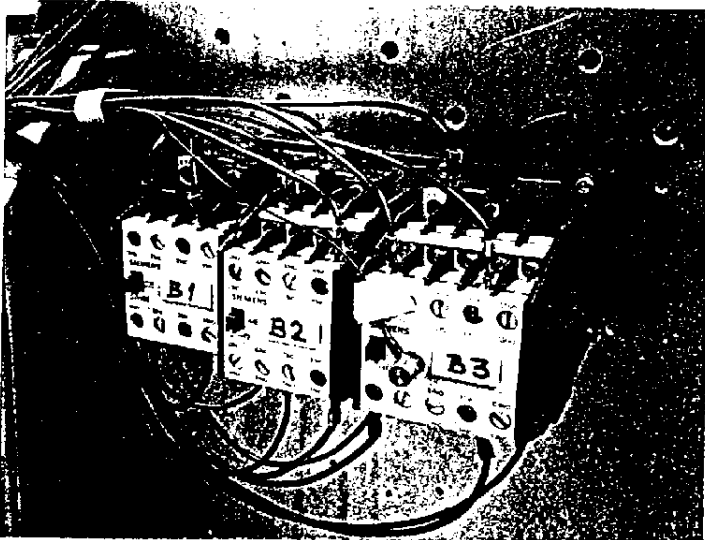
Integrated to the charge amplifier SWE 379

6. Recording equipment

Plotter	:	Hewlett Packard HP 7090 A
Photo corder	:	Yokogawa Electric YEW 2932
Stroboscope	:	Brüel & Kjaer 4912
Calculator	:	Amstrad PC 1512 SD
Transient recorder	:	Amstrad DMP 3160

7. Test setup:

3TH8244 -

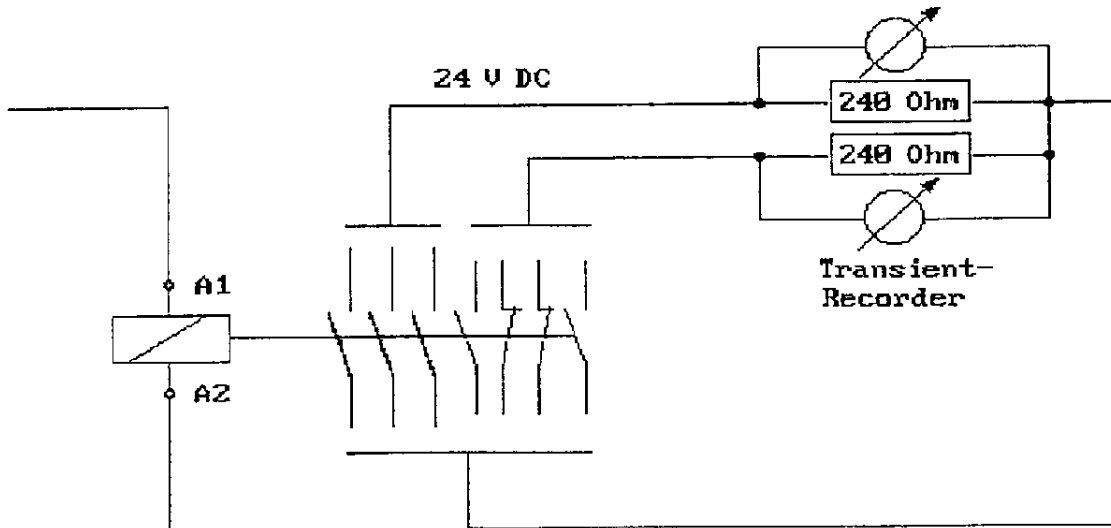


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8. Circuit for function test



During the test the contacts were switched in series or parallel as usefull for the checking.

9. Tests

Carried out in the 3 main axis:

- Resonance search
 - Slide sine 2 to 35 Hz
 - Exciting level 2 m/s²
 - Change of frequency (speed) 1 octave/min

- Loading
 - Slide sine 4,5 to 35 Hz ON
 - 35 to 4,5 Hz OFF
 - 4,5 to 35 Hz ON-OFF actions

- Exciting level changed continuous in accordance to ZEN 000 DD/7080.9/1 attachment B, Table 1b

- Additional Loading
 - Continuous sine 2 s ON
 - 2 s OFF

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04.02.1991

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Exciting frequency (Hz) with snap - and screw - mounted test samples:

Contactor Type	3TH40/80	3TH42/82	3TH43/83
X-axis	12,2	12,2	12,2
Y-axis (min)	12,0	11,6	11,3
Y-axis (max)	22,5	22,5	21,1
Z-axis	12,2	12,2	12,2

Exciting level (m/s²) with snap - and screw - mounted test samples:

Contactor Type	3TH40/80	3TH42/82	3TH43/83
X-axis	60 x 1,4	60 x 1,4	60 x 1,4
Y-axis (min)	35 x 1,4	29 x 1,4	22 x 1,4
Y-axis (max)	33 x 1,4	29 x 1,4	23 x 1,4
X-axis	60 x 1,4	60 x 1,4	60 x 1,4

(Determination of the exciting frequency see Item 11)

- Function test and monitoring of the contacts during the loading:
Operating voltage in ON-state ($0,75 \times U_s$) and in action ($0,8 \times U_s$).

10. Test result

- Resonance search with slide sine:
Screw-mounted devices: no resonance frequencies to find
Snap-mounted devices: with contactors 3TH40/42 and 3TH80/82 no resonance frequencies were to find. The contactors 3TH83/43 have a resonance frequency at 33 Hz in the X-axis.
- Arithmetic calculation of the frequency of the movable mass in the Y-axis (moving direction of the operating assembly):

Contactor Type	3TH40/80	3TH42/82	3TH43/83
frequency (Hz) min	8,5	8,2	8,0
max	15,9	15,9	14,9

- During the loading and additional loading tests there were no malfunction exceeding the permissible tolerances.
- The test specimens met the function tests after the loadings with success.

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04.02.1991

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11. Calculation of the Exciting frequency:

Arithmetic estimation of the inherent frequency:

$$f_0 = [1000^{0,5} / (2 \cdot 3,14)] (c/m)^{0,5}$$

Contact carrier complete

Contactor Type	3TH40/80	3TH42/82	3TH43/83
compl. movable mass m (g)	70	75	80
resultant springrate c in OFF-position (N/m)			
min	200	200	200
max	700	750	700
Inherent frequency f_0 (Hz)			
min	8,5	8,2	8,0
max	15,9	15,9	14,9

The inherent frequencies of the main - and auxiliary contact system are above 35 Hz.

The exciting frequency f_{e0} was ascertained in accordance with

ZEN 000 DD/7080.9/1 Abs. 9.2.1 followed:

Resonance frequency 25 Hz: $f_{e0} = 2^{0,5} f_0$

Resonance frequency 25 Hz: $f_{e0} = 0,35 f_0 \text{ min}$