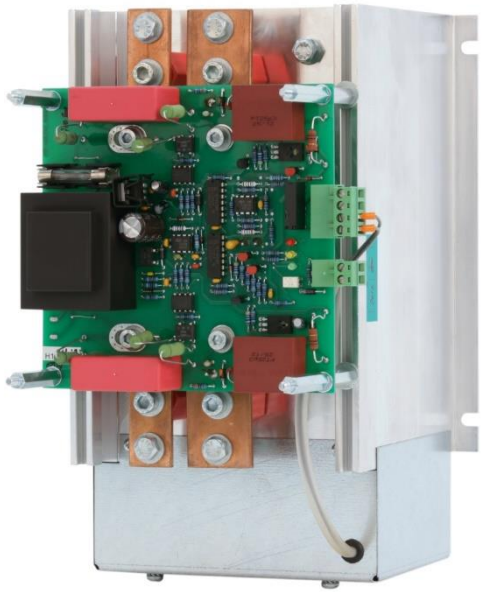
BLR-CM Controller+TS



A fast switch needs a fast controller

BELUK CM controllers with transistor outputs have a real-time algorithm with approx. 1 ms reaction time after measurement.

All needed steps to reach the target cos phi are switched simultaneously.

After measuring one cycle of mains voltage, the control deviation is calculated and all necessary steps are switched in one operation. The time from end of measuring to generation of the switching pulse is less 150µsec.

Facts:

- Thyristor switch for rapid switching of capacitors in dynamic compensation systems
- Switching without inrush current, smooth disconnecting
- High switching frequency
- Recovery time 20ms
- Permanent load

Features / Application:

Advantages of Thyristorswitches

- fast (next zero crossing)
- no wear and tear (unlike contactors)
- smooth (no transients)

Therefore typical uses are:

- dynamic changing loads (elevators, cranes, welding sets,…)
- rapid back and forth switching loads

switching characteristic

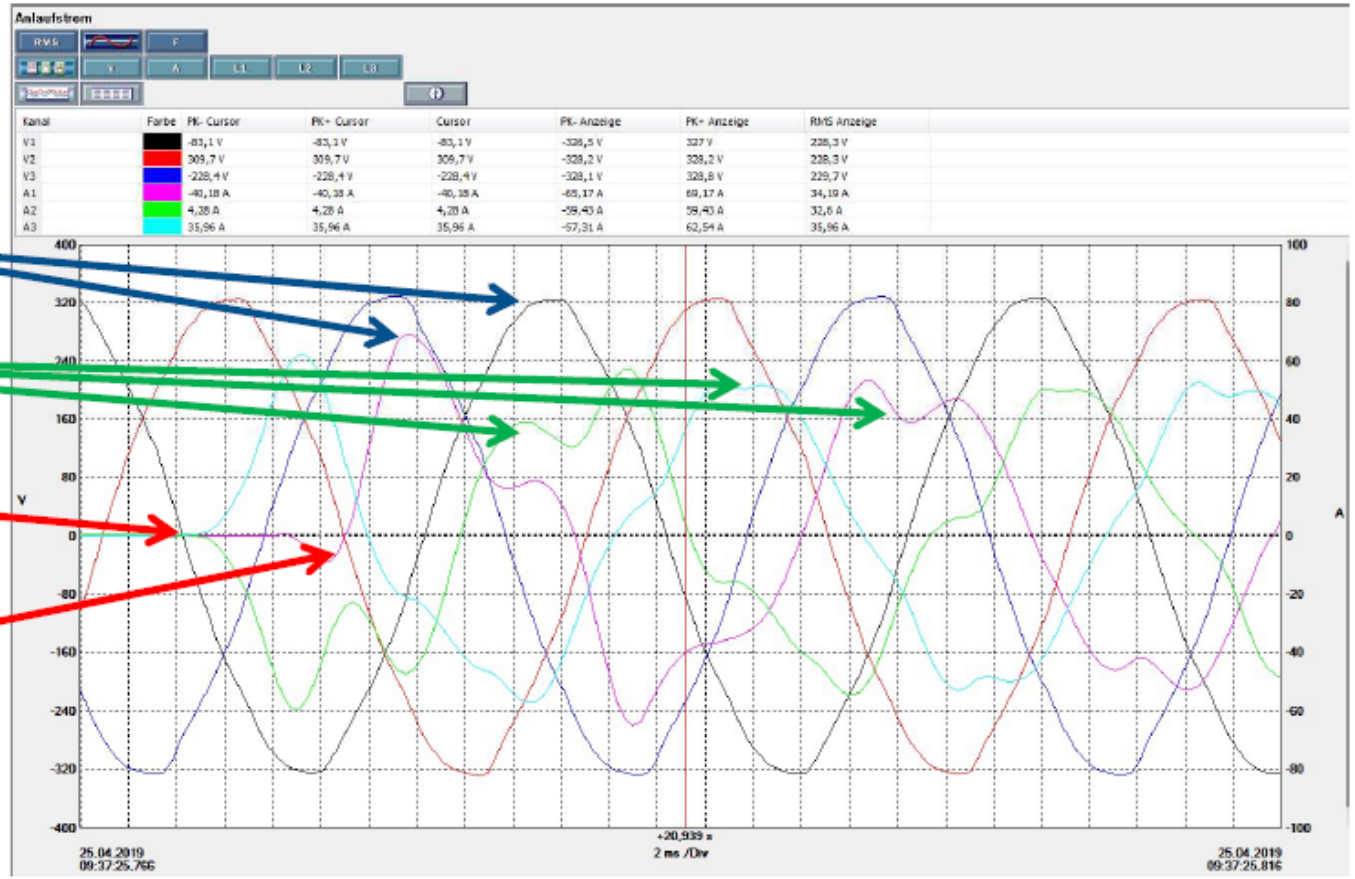
Switch-ON of a 25 kvar 3-phase capacitor by an BEL-TS thyristor switch:

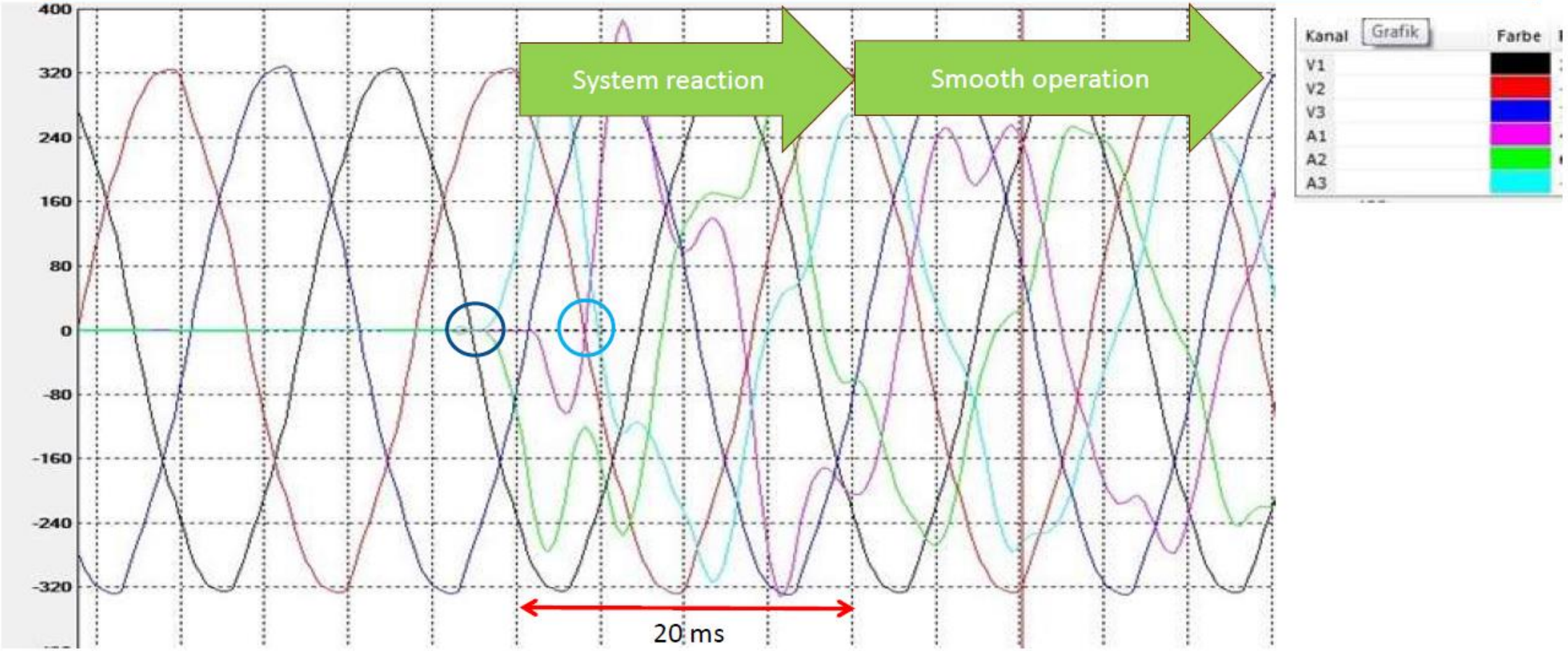
No Voltage or current spikes

Double peak due to Harmonics (3rd)

Switching on of A2, A3

Switching on of A1
(6,6 ms later)

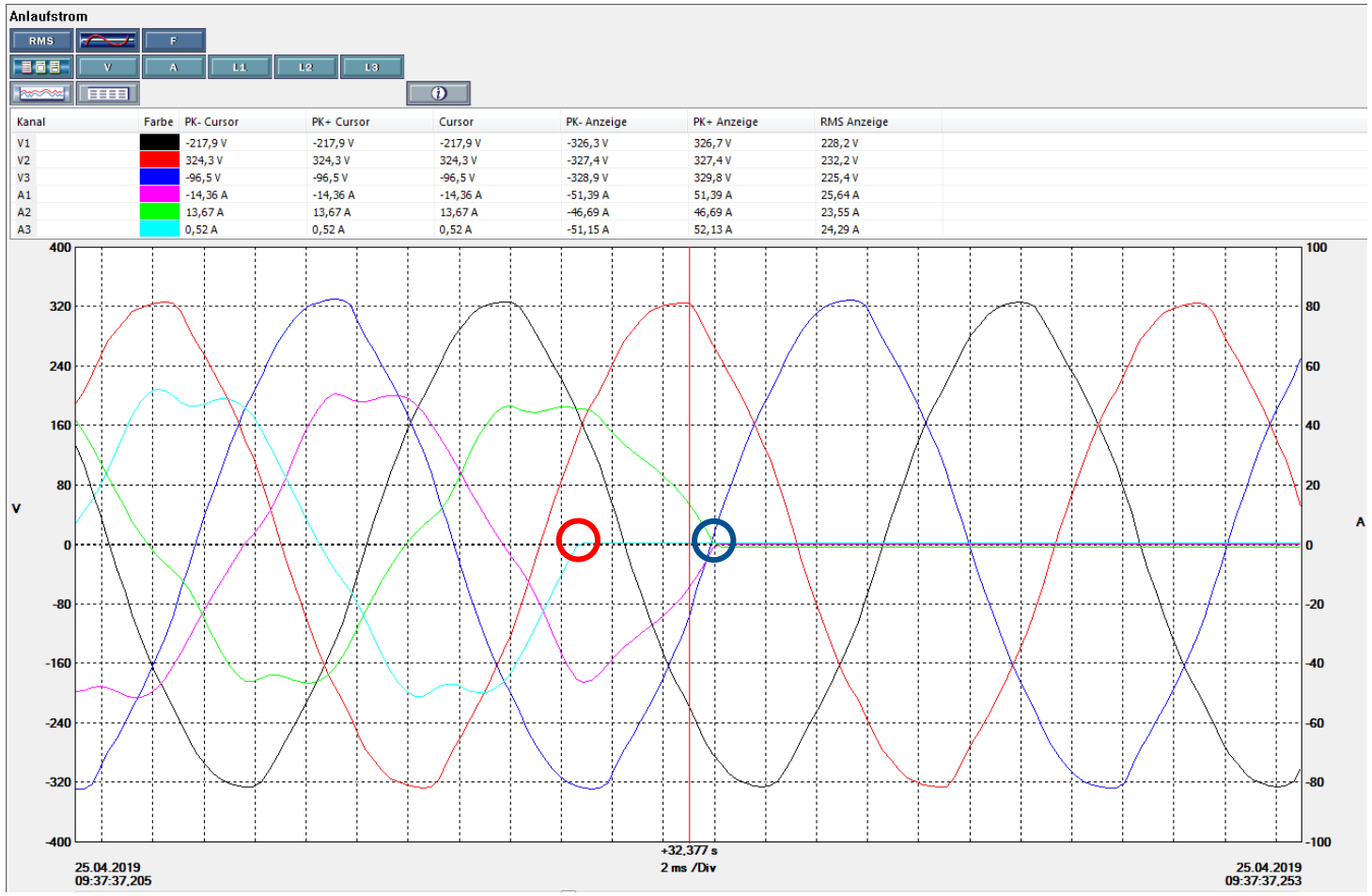



400
320
240
160
80
0
-80
-160
-240
-320
System reaction
Smooth operation
20 ms
Kanal
Grafik
Farbe
V1
V2
V3
A1
A2
A3

switching characteristic

Switch-OFF of a 25 kvar 3-phase capacitor by an BEL-TS thyristor switch:

- First zero-crossing of A3 (module L3) after OFF-command
- Switch-OFF of A1 (module L1) 120° later (6,66 ms)
- stable operation state all the time
- No voltage and current peaks occur which strain or damage other connected electrical components

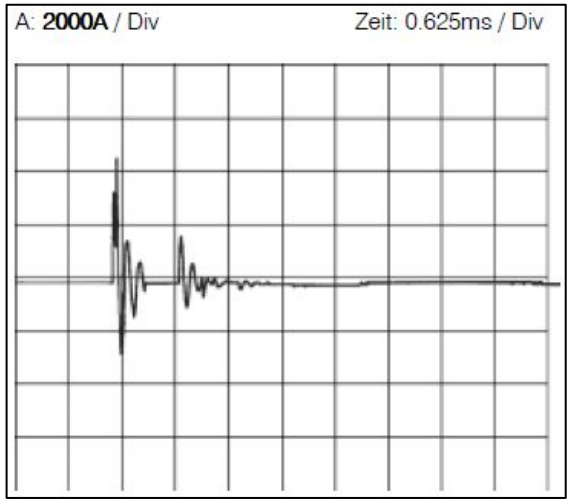


Switching on a 50 kvar capacitor with different switchgear (1)

- Switch-on of a 50 kvar capacitor in a non-choked system without pre-contacts:

→ Massive distortion of current sine wave with a current peak > 4000 A (nominal current peak Î = 101 A).

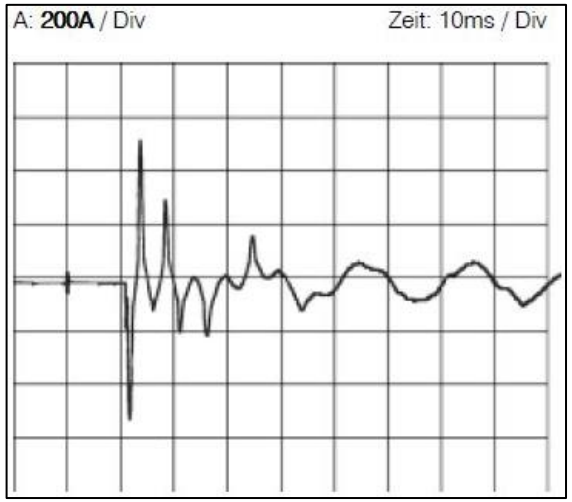
→ Data loss, major disturbances and damage of other components are possible



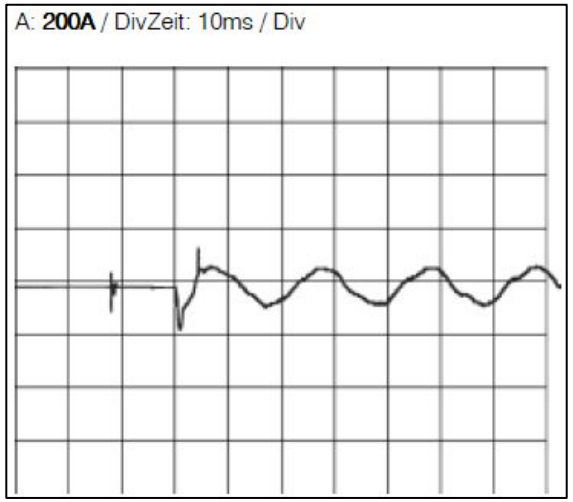
- Switch-on of a 50 kvar capacitor in a choked system without pre-contacts:

→ Significant distortion with a current peak > 500 A (nominal current peak Î = 101 A)

→ Data loss , major disturbances and damage of other components are possible

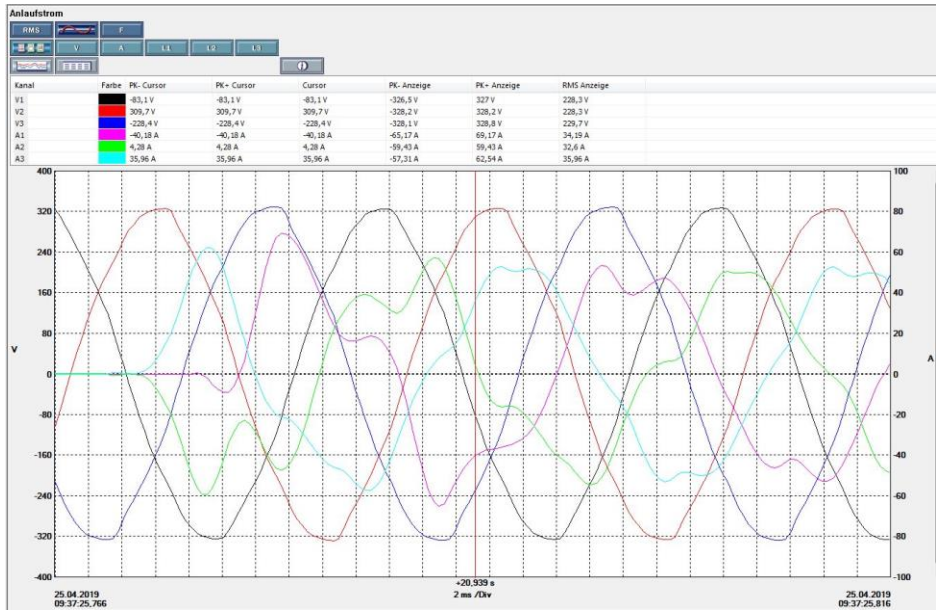


Switching on a 50 kvar capacitor with different switchgear (2)



- Switch-on of a 50 kvar capacitor in a choked system with pre-contacts:

→ Improved distortion of current sine wave with a current peak ≈ 200 A (nominal current peak Î = 101 A)



Switch-on of a 25 kvar capacitor with BEL TS:

→ No distortion of the current sine wave

→ nominal current peak Î = 51 A

Available ratings:

25 kvar	50 kvar	60 kvar	75 kvar	100 kvar	125 kvar
400 V + UL	400 V	400 V + UL	400 V	400 V	
440 V	440 V		440 V	440 V	
480 V + UL	480 V + UL		480 V + UL	480 V + UL	480 V + UL
	690 V			690V	

Certificate

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

America

CERTIFICATE

No. U8V 015997 0006 Rev. 00

Holder of Certificate: **Beluk GmbH**
Taubenstr. 1
86956 Schongau
GERMANY

Production Facility(ies): 015997

Certification Mark:

C US

Product: **Control Equipment**
(Thyristor switch)

Model(s): **BEL TS**
Type: 3TA162H2-EB22B-03

Parameters:

Type:	**3TA162H2-EB22B-03**
Rated Supply Voltage US:	120 V
Rated Input Voltage U:	480 V
Rated Input Current:	160 A
Reactive Power:	125 kvar
Rated Frequency:	50/60 Hz
Protection Class:	I

Tested according to: UL 508:2018

This product was voluntarily tested to the relevant safety requirements referenced on this certificate. It can be marked with the certification mark above. The mark must not be altered in any way. This productcertification system operated by TÜV SÜD America Inc. most closely resembles system 3 as defined inISO/IEC 17067. Certification is based on the TÜV SÜD "Testing and Certification Regulations". TÜV SÜDAmerica Inc. is an OSHA recognized NRTL and a Standards Council of Canada accredited Certification body.

Test report no.: 028-713152555-000

Date, 2019-07-12

(Abdul Sabbagh)

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