# REPLACEMENT TABLE FOR THE POWER SEMICONDUCTORS OF SAMI STAR FREQUENCY CONVERTERS

The replacement table gives a list of those semiconductors, which can be used in SAMI STAR frequency converters. The types given for each semiconductor are interchangeable. Detail information about the mounting of the power semiconductor is given in the semiconductor assembly instructions (code 57192593).

**Table**



## 1. REPLACEMENT TABLE FOR GTO-THYRISTORS

On the following table are listed the GTO's, which are approved for SAMI STAR. Mechanically these GTO's are of press-pack type. Because of different dimensions of the GTO's there are available installation set for each specification, if it is necessary. The installation set including instructions are delivered with spare GTO's.

LEGEND:

| | |
|---|---|
| $I_{TGQ}$ | Controllable turn-off current |
| $V_{DRM}$ | Peak off-state voltage |
| F | Clamping force in kN |
| d * h | GTO diameter * height in mm |

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### 1.1 $I_{TGQ}$ = 370 A — Standard spec. 5152 8891

### $V_{DRM}$ = 1300 V — Code: 3AFE 61197711 (ABB P/N 61197711)

Installation set:

| | | | | |
|---|---|---|---|---|
| Chopper GTO in | SAFUI | 160F415<br>250F415<br>200F500<br>290F460<br>315F500 | Clamp<br>Code: | SLZF 70A (5...12 kN)<br>3AFE 5716 8480 |
| Main GTO in | SAFUK | 80F500 | | |

| Old code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 0991 6431 | Toshiba | S6475R | 5 | 45 * 20 |

| | | | | |
|---|---|---|---|---|
| 3AFE 1000 2141 | Mitsubishi | FG450BL-261E | 5 | 54 * 18 |
| 3AFE 1000 2150 | GEC Plessey | DGT304SE13X1 | 5 | 40 * 15 |
| 3AFE 0991 7632 | Westcode | WG6013/ZA | 7 | 50 * 16 |
| | Westcode | WG4013D2S | 7 | 50 * 16 |

**1.2 $I_{TGQ}$ = 560 A Standard spec. 5152 8905**

**$V_{DRM}$ = 1300 V Code: 3AFE61179828 (ABB P/N 61179828)**

Installation set code: 3AFE 5812 8171

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 160F415 | Clamp SLZF 89C (5...12 kN) |
| | " | 200F500 | Code: 3AFE 5786 1444 |
| Chopper GTO in | SAFUI | 400F415 | Clamp SLZF 70A (5...12 kN) |
| | " | 460F460 | Code: 3AFE 5716 8480 |
| | " | 500F500 | |
| Main GTO in | SAFUK | 125F500 | |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 7641 | Toshiba | S6476R | 7 | 51 * 20 |
| 3AFE 0991 7560 | Mitsubishi | FG600AL-26-5620 | 10 | 56 * 18 |
| 3AFE 0991 7632 | Westcode | WG6013/ZA | 7 | 50 * 16 |
| 3AFE 1000 2222 | GEC Plessey | DGT304SE13X2 | 5 | 40 * 15 |
| 3AFE 1000 1463 | ABB Väst | YSG700 * | 7 | 60 * 26 |

* Only main GTO in SAFUI

**Note:** In the inverters delivered before 86-05-22, the clamp of the main GTOs has been SLZF 89A (7...20 kN), code 3AFE 5716 8463.

**1.3 $I_{TGQ}$ = 880 A Standard spec. 5152 8913**

**$V_{DRM}$ = 1300 V Code: 3AFE 61179801 (ABB P/N 61179801)**

Installation set code: 3AFE 5812 8180

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 250F415 | Clamp SLZF 89C (5...12 kN) |
| | | 290F460 | Code 3AFE 5786 1444 |
| | | 315F500 | |
| Chopper GTO in | SAFUI | 630F415 | Clamp SLZF 70A (5...12 kN) |
| | | 730F460 | Code 3AFE 5716 8480 |
| | | 800F500 | |
| | | 1000F500 | |
| Main GTO in | SAFUK | 200F500 | Clamp SLZF 89A (7...20 kN) |
| | | | Code 3AFE 5716 8463 |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 7756 | Toshiba | S6425R | 12 | 60 * 26 |
| 3AFE 0991 7756 | Toshiba | S6723R | 7 | 51 * 20 |
| 3AFE 0991 7586 | Mitsubishi | FG1000AL-26-8830 | 12 | 56 * 18 |
| 3AFE 0991 7748 | Westcode | WG9013A3A | 7 | 50 * 16 |
| 3AFE 1000 1471 | ABB Väst | YSG1000 * | 12 | 78 * 26 |
| | ABB Semic. | CSG809-14A04 | 11 | 58 * 17 |

* Only main GTO in SAFUI
**Note:** In the inverters delivered before 86-05-22, the clamp of the main GTOs has been SLZF 89A (7...20 kN), code 3AFE 5716 8463.

### 1.4 $I_{TGQ}$ = 1400 A Standard spec. 5152 8921

### $V_{DRM}$ = 1300 V Code: 3AFE61179780 (ABB P/N 61179780)

Installation set code : 3AFE 5812 8198

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 400F415 | Clamp SLZF 117 (11...25 kN) |
| | | 460F460 | Code 3AFE 5741 9709 |
| | | 500F500 | |

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 7888 | Toshiba | S6426R | 20 | 93 * 26 |
| 3AFE 0991 7888 | Toshiba | S6594R | 14 | 75 * 26 |
| 3AFE 0991 7811 | Mitsubishi | FG1000AL-26-1430 | 14 | 56 * 18 |
| 3AFE 1000 1145 | Westcode | WG14013 | 17 | 74 * 26 |

**Note:** In the inverters, delivered before 90-09-01, 1400 A's GTOs were used.

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### 1.5 $I_{TGQ}$ = 1500 A Standard spec. 5812 4729

### $V_{DRM}$ = 1300 V Code: 3AFE 61179780 (ABB P/N 61179780)

Installation set code: 3AFE 5812 8198

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 400F415 | Clamp SLZF 117 (11...25 kN) |
| | | 460F460 | Code 3AFE 5741 9709 |
| | | 500F500 | |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 7811 | Mitsubishi | FG1000AL-26-1540 | 14 | 56 * 18 |
| 3AFE 0991 7888 | Toshiba | S6426R | 20 | 93 * 26 |
| 3AFE 0991 7888 | Toshiba | S6594R | 14 | 75 * 26 |
| 3AFE 1000 1145 | Westcode | WG14513C2H | 17 | 74 * 26 |
| | Westcode | WG15013B8C | 17 | 74 * 26 |
| | ABB Semic. | 5SGA1514F0001 | 15 | 75 * 26 |

**Note:** In the inverters, delivered after 90-09-01, 1500 A's GTOs were used.

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**1.6** **$I_{TGQ}$ = 2220 A** **Standard spec. 5152 8930**

**$V_{DRM}$ = 1300 V** **Code: 3AFE 61179771 (ABB P/N 61179771)**

Installation set -

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 630F415<br>730F460<br>800F500 | Clamp SLZF 142 (16...50 kN)<br>Code 3AFE 5719 8664 |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 8001 | Toshiba | S6427R | 33 | 120 * 26 |
| 3AFE 0991 8001 | Toshiba | S6724R | 20 | 93 * 26 |
| | ABB Semic. | CSG2001-14A04 | 20 | 100 * 26 |

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**1.7** **$I_{TGQ}$ = 340 A** **Standard spec. 5152 8964**

**$V_{DRM}$ = 1700 V** **Code: 3AFE 61197745 (ABB P/N 61197745)**

Installation set -

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 40F660<br>160F660 | Clamp SLZF 89C (5...12 kN)<br>Code 3AFE 5786 1444 |
| Chopper GTO in | SAFUI | 40F660<br>160F660<br>250F660<br>340F575<br>400F660 | Clamp SLZF 70A (5...12 kN)<br>Code 3AFE 5716 8480 |
| Main GTO in | SAFUK | 100F660 | |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 6415 | Toshiba | S6475W | 5 | 45 * 20 |
| 3AFE 1000 2184 | Mitsubishi | FG450BL-34 | 5 | 56 * 18 |
| 3AFE 0991 8167 | Westcode | WG6017/ZB | 7 | 50 * 16 |

**Note:** In the inverters delivered before 86-05-22. the clamp of the main GTOs has been SLZF 89A (7...20 kN), code 3AFE 5716 8463.

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**1.8** **$I_{TGQ}$ = 530 A** **Standard spec. 5152 8972**

**$V_{DRM}$ = 1700 V** **Code: 3AFE 61179755 (ABB P/N 61179755)**

Installation set code: 3AFE 5812 8171

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 250F660 | Clamp SLZF 89C (5...12 kN)<br>Code 3AFE 5786 1444 |

| | | | |
|---|---|---|---|
| Chopper GTO in | SAFUI | 540F575 | Clamp SLZF 70A (5...12 kN) |
| | | 630F660 | Code 3AFE 5716 8480 |
| Main GTO in | SAFUK | 160F660 | |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 8159 | Toshiba | S6476W | 7 | 51 * 20 |
| 3AFE 0991 8141 | Mitsubishi | FG600AL-34-5320 | 10 | 56 * 18 |
| 3AFE 1000 2192 | Westcode | WG6017 D2F | 7 | 50 * 16 |
| 3AFE 1000 1463 | ABB Väst. | YSG700 * | 7 | 60 * 26 |

* Only main GTO in SAFUI

**Note:** In the inverters delivered before 86-05-22 the clamp of the main GTOs has been SLZF 89A (7...20 kN), code VE 5716 8463.

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**1.9 $I_{TGQ}$ = 600 A Standard spec. 6103 2649**

**$V_{DRM}$ = 1700 V Code: 3AFE 1002 8558 (ABB P/N 10028558)**

| | | | |
|---|---|---|---|
| Main GTO in | SAFUK | 63F380 | Clamp SLZF 89C (5...12 kN) |
| | | 100F380 | Code: 3AFE 5786 1444 |
| | | 160F380 | |
| | | 80F500 | |
| | | 125F500 | |
| | | 200F500 | |
| | | 100F660 | |
| | | 160F660 | |
| | | 250F660 | |
| | | 250F690 | |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| | Toshiba | SG800W24 (STROM) | 7 | 51 * 20 |

**Note:** This GTO is only used in the braking chopper units (SAFUK)

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**1.10 $I_{TGQ}$ = 840 A Standard spec. 5152 8981**

**$V_{DRM}$ = 1700 V Code: 3AFE 61179747 (ABB P/N 61179747)**

Installation set code: 3AFE 5812 8180

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 340F575 | Clamp SLZF 89C (5...12 kN) |
| | | 400F660 | Code 3AFE 5786 1444 |
| Chopper GTO in | SAFUI | 870F575 | Clamp SLZF 70A (5...12 kN) |
| | | 1000F660 | Code 3AFE 5716 8480 |
| | | 1370F690 | |
| Main GTO in | SAFUK | 250F660 | Clamp SLZF 89A (7...20 kN) |
| | | 250F690 | Code 3AFE 5716 8463 |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 3AFE 0991 8230 | Toshiba | S6425W | 12 | 60 * 26 |
| 3AFE 0991 8230 | Toshiba | S6723W | 7 | 51 * 20 |
| 3AFE 0991 8221 | Mitsubishi | FG600AL-34-8430 | 10 | 56 * 18 |
| 3AFE 1000 2206 | Westcode | WG9017 D2G | 7 | 50 * 16 |
| 3AFE 1000 1471 | ABB Väst. | YSG1000 * | 12 | 78 * 26 |
| | ABB Semic. | CSG809-14A04 | 11 | 58 * 17 |

* Only main GTO in SAFUI

**Note:** In the inverters delivered before 86-05-22, the clamp of the main GTOs has been SLZF 89A (7...20 kN), code 3AFE 5716 8463.

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**1.11 $I_{TGQ}$ = 1400 A Standard spec. 5152 8999**

**$V_{DRM}$ = 1700 V Code : 3AFE 61179739 (ABB P/N 61179739)**

Installation set code : 3AFE 5812 8198

Main GTO in SAFUI 540F575 Clamp SLZF 117 (11...25 kN)
630F660 Code 3AFE 5741 9709

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 8400 | Toshiba | S6426W | 20 | 93 * 26 |
| 3AFE 0991 8400 | Toshiba | S6594W | 14 | 75 * 26 |
| 3AFE 0991 8264 | Mitsubishi | FG1000AL-34-1340 | 14 | 56 * 18 |
| 3AFE 1000 1153 | Westcode | WG14017B8D | 17 | 74 * 26 |

**Note:** In the inverters, delivered before 90-09-01, 1330 A's GTOs were used.

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**1.12 $I_{TGQ}$ = 1400 A Standard spec. 5812 4737**

**$V_{DRM}$= 1700 V Code : 3AFE 61179739 (ABB P/N 61179739)**

Installation set code: 3AFE 5812 8198

Main GTO in SAFUI 540F575 Clamp SLZF 117 (11...25 kN)
630F660 Code 3AFE 5741 9709

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 8400 | Toshiba | S6426W | 20 | 93 * 26 |
| 3AFE 0991 8400 | Toshiba | S6594W | 14 | 75 * 26 |
| 3AFE 0991 8264 | Mitsubishi | FG1000AL-34-1440 | 14 | 56 * 18 |
| 3AFE 1000 1153 | Westcode | WG14017B8D | 17 | 74 * 26 |
| 3AFE 1000 2419 | Meidensha | G14J17YNH | 18 | 92 * 26 |
| | ABB Semic. | 5SGA1518F0001 | 15 | 75 * 26 |

**Note:** In the inverters, delivered after 90-09-01, 1400 A's GTOs were used.

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**1.13** **$I_{TGQ}$ = 2100 A** **Standard spec. 5152 9006**

**$V_{DRM}$ = 1700 V** **Code: 3AFE 61179721 (ABB P/N 61179721)**

Installation set -

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 870F575 | Clamp SLZF 142 (16...50 kN) |
| | | 1000F660 | Code 3AFE 5719 8664 |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 8558 | Toshiba | S6427W | 33 | 120 * 26 |
| 3AFE 0991 8558 | Toshiba | S6724W | 20 | 93 * 26 |
| 3AFE 1000 0327 | Siemens | BGTS2000A18 | 22 | 100 * 26 |
| | ABB Väst. | YSG2000P18 | 20 | 120 * 26 |
| | ABB Semic. | CSG2001-18A04 | 20 | 100 * 26 |

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**1.14** **$I_{TGQ}$ = 3000 A** **Standard spec. 6101 2443**

**$V_{DRM}$ = 1700 V** **Code: 3AFE 61179712 (ABB P/N 61179712)**

Installation set: -

| | | | |
|---|---|---|---|
| Main GTO in | SAFUI | 1000F500 | Clamp SLZF 142 (16...50 kN) |
| | | 1370F690 | Code 3AFE 57198664 |

| Old code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| | ABB Semic. | CSG3001-18A04 | 40 | 120 * 26 |

## 2. REPLACEMENT TABLE FOR TRANSISTOR MODULES

On the following table are listed the transistor (GTR) modules, which are approved for SAMI STAR frequency converters.

LEGEND:

| | |
|---|---|
| $I_C$ | - Continuous collector current |
| $V_{CE}$ | - Peak off-state voltage |
| T | - Mounting torque in Nm for module type devices(case to heatsink) |
| l * w * h | - Module length * width * height in mm |

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**2.1** **$I_C$ = 75 A** **Dual transistor**

**$V_{CE}$ = 1000 V** **Standard spec. 5351 3492**

Used in SAFUI 25F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0013 | Fuji | 2DI75Z-100(-E) | 3.0 | 108*34*37 |
| | Toshiba | MG75M2YK1 | 3.0 | 108*35*38 |
| | Mitsubishi | QM75DY-2H | 3.0 | 108*34*37 |
| | Powerex | KD221K75 | Same component as QM75DY-2H | |
| 3AFE 0981 0056 | Fuji | 2DI75Z-120(-E) * | 3.0 | 108*34*37 |
| | Toshiba | MG75Q2YK1 * | 3.0 | 108*35*38 |
| | Mitsubishi | QM75DY-24 * | 3.0 | 108*34*37 |
| | Powerex | KD221275 | Same component as QM75DY-24 | |

**Note:** In earlier inverter versions (code 5743 8690) also the Toshiba transistor MG75M2CK1 (code 0981 0005) was used. **This transistor should not be used.**
*** Note:** - This GTR has Vce = 1200 V (Standard spec. 5351 6904)

## 2.2 $I_C$ = 150 A Dual transistor

## $V_{CE}$ = 1000 V Standard spec. 5351 3514

Used in SAFUI 40F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0111 | Fuji | 2DI150Z-100(-E) | 3.0 | 108*62*37 |
| | Toshiba | MG150M2YK1 | 3.0 | 108*62*38 |
| | Mitsubishi | QM150DY-2H | 3.0 | 108*62*37 |
| | Powerex | KD421K15 | Same component as QM150DY-2H | |
| 3AFE 0981 0137 | Fuji | 2DI150Z-120(-E) * | 3.0 | 108*62*37 |
| | Toshiba | MG150Q2YK1 * | 3.0 | 108*62*38 |
| | Mitsubishi | QM150DY-24 * | 3.0 | 108*62*37 |
| | Powerex | KD421215 | Same component as QM150DY-24 | |

**Note:** In earlier inverter versions (code 5743 8711) also the Toshiba transistor MGl50M2CK1 (code 09810102) was used. **This transistor should not be used.**
*** Note**: - This GTR has Vce = 1200 V (Standard spec. 5351 6921)
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## 2.3 $I_C$ = 200 A Single transistor

## $V_{CE}$ = 1000 V Standard spec. 5351 3522

Used in SAFUI 63F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0251 | Fuji | 1DI200Z-100-04(-E) | 3.0 | 108*62*42 |
| | Toshiba | MG200M1UK1 | 3.0 | 108*62*44 |
| | Mitsubishi | QM200HA-2H | 3.0 | 108*62*42 |
| | Powerex | KS621K20 | Same component as QM200HA-2H | |
| 3AFE 0981 0269 | Fuji | 1DI200Z-120-05(-E)* | 3.0 | 108*62*42 |
| | Toshiba | MG200Q1UK1* | 3.0 | 108*62*44 |

| | | | | |
|---|---|---|---|---|
| | Mitsubishi | QM200HA-24 * | 3.0 | 108*62*42 |
| | Powerex | KS621220 | Same component as QM200HA-24 | |

**Note:** In earlier inverter versions (code 5743 8738) also the Toshiba transistor MG200M1FK1 (code 09810242) was used. **This transistor should not be used.**
*** Note:** - This GTR has Vce = 1200 V (Standard spec. 5351 6939)

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## 2.4 $I_C$ = 300 A Single transistor

## $V_{CE}$ = 1000 V Standard spec. 5351 3531

Used in SAFUI 100F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0315 | Fuji | 1DI300Z-100-04(-E) | 3.0 | 108*62*42 |
| | Toshiba | MG300M1UK1 | 3.0 | 108*62*44 |
| | Toshiba | MG300M1UK2 | 3.0 | 108*62*44 |
| | Mitsubishi | QM300HA-2H | 3.0 | 108*62*42 |
| | Powerex | KS621K30 | Same component as QM300HA-2H | |
| 3AFE 0981 0340 | Fuji | 1DI300Z-120-05(-E)* | 3.0 | 108*62*42 |
| | Toshiba | MG300Q1UK1 * | 3.0 | 108*62*44 |
| | Toshiba | MG300Q1UK2 * | 3.0 | 108*62*44 |
| | Mitsubishi | QM300HA-24 * | 3.0 | 108*62*42 |
| | Powerex | KS621230 | Same component as QM300HA-24 | |

**Note:** In earlier inverter versions (code 5743 8754) also the Toshiba transistor MG300M1FK1 (code 0981 0307) was used. **This transistor should not be used.**
*** Note:** - This GTR has $V_{CE}$ = 1200 V (Standard spec. 5351 6947)

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## 2.5 $I_C$ = 75 A Dual transistor $V_{CE}$ =

## 1200 V Standard spec. 5351 6904

Used in SAFUI 32F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0056 | Fuji | 2DI75Z-120(-E) | 3.0 | 108*34*37 |
| | Toshiba | MG75Q2YK1 | 3.0 | 108*35*38 |
| | Mitsubishi | QM75DY-24 | 3.0 | 108*34*37 |
| | Powerex | KD221275 | Same component as QM75DY-24 | |

**Note:** In earlier inverter versions (code 5742 9011) also the Fuji transistor 2DI75A-120 (code 0981 0048) was used. **This transistor should not be used.**

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## 2.6 $I_C$ = 150 A Dual transistor

$V_{CE}$ = 1200 V Standard spec. 5351 6921

Used in SAFUI 50F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0137 | Fuji | 2DI150Z-120(-E) | 3.0 | 108*62*37 |
| | Toshiba | MG150Q2YK1 | 3.0 | 108*62*38 |
| | Mitsubishi | QM150DY-24 | 3.0 | 108*62*37 |
| | Powerex | KD421215 | Same component as QM150DY-24 | |

**Note:** In earlier inverter versions (code 57429020) also the Fuji transistor 2DI150A-120 (code 09810129) was used. **This transistor should not be used..**

## 2.7 $I_C$ = 200 A Single transistor

$V_{CE}$= 1200 V Standard spec. 5351 6939

Used in SAFUI 80F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0269 | Fuji | 1DI200Z-120-05(-E) | 3.0 | 108*62*42 |
| | Toshiba | MG200Q1UK1 | 3.0 | 108*62*44 |
| | Mitsubishi | QM200HA-24 | 3.0 | 108*62*42 |
| | Powerex | KS621220 | Same component as QM200HA-24 | |

**Note:** In earlier inverter versions (code 5742 9038) also the Fuji transistor 1DI200A-120 (code 0981 0323) was used. **This transistor should not be used.**

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## 2.8 $I_C$= 300 A Single transistor

$V_{CE}$= 1200 V Standard spec. 5351 6947

Used in SAFUI 125F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 0340 | Fuji | 1DI300Z-120-05(-E) | 3.0 | 108*62*42 |
| | Toshiba | MG300Q1UK1 | 3.0 | 108*62*34 |
| | Toshiba | MG300Q1UK2 | 3.0 | 108*62*34 |
| | Mitsubishi | QM300HA-24 | 3.0 | 108*62*42 |
| | Powerex | KS621230 | Same component as QM300HA-24 | |

**Note:** In earlier inverter versions (code 57429046) olso the Fuji transistor 1DI300A-120 (code 09810331) was used. **This transistor should not be used.**

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# 3. REPLACEMENT TABLE FOR THYRISTORS

On the following table are listed the thyristors, which are approved for SAMI STAR thyristor braking unit (SAFUX / SAFUT). Mechanically these thyristors are of press-pack (capsule) or module type.

LEGEND:

| | |
|---|---|
| $I_{TSM}$ | - Maximum surge on-state current |
| $V_{DRM}$ | - Repetitive peak off-state voltage |
| F | - Clamping force in kN for press-pack |
| T | - Mounting torque in Nm for module type devices(case to heatsink) |
| d * h | - Press-pack diameter * height in mm |
| l * w * h | - Module length * width * height in mm |

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**3.1** **$I_{TSM}$ = 7000 A** **Module type**

**$V_{DRM}$= 1550 V** **Standard spec. 3450 9662**

Used in SAFUX 315 F 500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 1000 2044 | IR | IRKT250-16S90 | 6.0 | 115*50*60 |

.....

**3.2** **$I_{TSM}$ = 16400 A** **Press-pack type**

**$V_{DRM}$ = 2050 V** **Standard spec. 5351 8541**

Used in SAFUX 315 F 500 Clamp SLZF 89B (16...30 kN)
500 F 500 Code 3AFE 5716 8455
800 F 500
400 F 660
630 F 660
1000 F 660

| Code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 0980 2011 | Westcode | N490CH22B8K | 20 | 74*28 |
| | Powerex | T9GO211003XX58 | 20 | 74*27 |

.....

**3.3** **$I_{TSM}$ = 34000 A** **Press-pack type**

**$V_{DRM}$ = 2100 V** **Standard spec. 5812 3871**

Used in SAFUX 2000F/A500 Clamp SLZF 142 (16...50 kN)
2500F/A660 Code 3AFE 57198664

| Old code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 1000 0564 | Westcode | N 980 CH 21 B4S | 37 | 110*37 |
| | ABB Semic. | 5STP 2422M001 | 50 | 110*36 |

.....

**3.4** **$I_{TSM}$ = 8000 A** **Module type**

**$V_{DRM}$= 2200 V** **Standard spec.**

Used in SAFUX 400 F 660

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 1000 0556 | ABB Västerås / | YSTT6-22 P22C * | 8 | 145*54*59 |

***** **Note**: - Manufacturing of this thyristor has been finished. In the thyristor braking units, delivered before 91-08-09, these thyristors were used.

## 4. REPLACEMENT TABLE FOR RECTIFIER DIODES

On the following table are listed the diodes, which are approved as rectifier diodes for SAMI STAR frequency converters. Mechanically they are of press-pack (capsule) or module type.

LEGEND:

| | |
|---|---|
| $I_{FRM}$ | - Maximum repetitive peak forward current |
| $I_{FSM}$ | - Maximum surge forward current |
| $V_{RRM}$ | - Maximum repetitive reverse voltage |
| T | - Mounting torque in Nm for module type devices(case to heatsink) |
| F | - Clamping force in kN for press-pack |
| d * h | - Press-pack diameter * height in mm |
| l * w * h | - Module type device dimensions in mm |

.....

**4.1** **$I_{FSM}$ = 1650 A** **Module type**

**$V_{RRM}$ = 1200 V** **Standard spec. 5351 3620**

Used in SAFUS 40F415
63F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3136 | IR | IRKD 91-12 | 5.0 | 92*20*35 |
| | Semikron | SKKD 81-12 | 5.0 | 93*20*35 |
| | Eupec(AEG) | DD85N 1200 | 4.0 | 92*20*35 |

.....

**4.2** **$I_{FSM}$ = 4500 A** **Module type**

**$V_{RRM}$ = 1200 V** **Standard spec. 5351 3646**

Used in SAFUS 100F415
160F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3128 | Eupec(AEG) | DD151N 1200 | 6.0 | 94*30*45 |
| | Semikron | SKKD 201-12 | 5.0 | 115*50*52 |
| | Siemens | DIL 78A80-V | 5.0 | 94*34*35 |
| | IR | IRKD 161-12S833 | 5.0 | 94*30*47 |

.....

**4.3** **$I_{FSM}$ = 7500 A** **Module type**

**$V_{RRM}$ = 1200 V** **Standard spec. 5351 3654**

Used in SAFUD 250F415

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3144 | IR | IRKD 260-12 | 5.0 | 115*50*60 |
| | Eupec(AEG) | DD260N 1400K | 6.0 | 115*50*52 |
| 3AFE 0981 3152 | IR | IRKD 260-16 * | 5.0 | 115*50*60 |
| | Eupec(AEG) | DD260N 1600K * | 6.0 | 115*50*52 |

***** **Note:** This diode has $I_{FSM}$ = 7500 A, $V_{RRM}$ = 1600 V (Standard spec. 5351 3671).

.....

**4.4** **$I_{FSM}$ = 1650 A** **Module type**

**$V_{RRM}$ = 1500 V** **Standard spec. 5352 0103**

Used in SAFUS 50F460
75F460
50F500
80F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3101 | IR | IRKD 71-16 | 5.0 | 92*20*37 |
| | IR | IRKD 81-16 | 5.0 | 92*20*37 |
| | Eupec(AEG) | DD86N 1600 | 4.0 | 92*25*37 |

.....

**4.5** **$I_{FSM}$ = 4500 A** **Module type**

**$V_{RRM}$ = 1500 V** **Standard spec. 5351 3662**

Used in SAFUS 115F460

180F460
125F500
200F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3110 | Eupec(AEG) | DD151N 1600 | 6.0 | 94*30*45 |
| | IR | IRKD 161-16S834 | 5.0 | 94*30*47 |
| | Siemens | DIL78A110-V | 5.0 | 94*34*35 |
| | Semikron | SKKD 201-16 | 5.0 | 115*50*52 |

.....

**4.6** **$I_{FSM}$ = 7500 A** **Module type**

**$V_{RRM}$ = 1500 V** **Standard spec. 5351 3671**

Used in SAFUD 315F500
SAFUC 315F500

| Code | Manufacturer | Type marking | T (Nm) | l * w * h(mm) |
|---|---|---|---|---|
| 3AFE 0981 3152 | IR | IRKD 260-16 | 5.0 | 115*50*60 |
| | Eupec(AEG) | DD260N 1600K | 6.0 | 115*50*52 |

**Note:** - Manufacturing of SAFUC 315F500 has been finished.

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**4.7** **$I_{FSM}$ = 11500 A** **Press-pack type**

**$V_{RRM}$ = 2100 V** **Standard spec. 5152 1579**

Used in SAFUS 140F575 Clamp SLZF 70A (5...12 kN)
Code 3AFE 5716 8480
SAFUD 400F415
SAFUC 500F500 Clamp SLZF 89A (7...20 kN)
800F500 Code 3AFE 5716 8463

| Code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 0980 5613 | IR | G1552PDE-S444 * | 9.8 | 42*16 |
| | Westcode | SW21CXC805 | 12 | 59*27 |
| | GE | A 540 LA | 9.8 | 42*15 |
| | GE | A 433 LA | 9.8 | 42*15 |

*** Note:** This diode needs the extra plate for the installation (code G1552PDE)
- Type marking -S444 is equivalent to -R30E22A

.....

**4.8** **$I_{FSM}$ = 11500 A** **Press-pack type**

**$V_{RRM}$ = 2300 V** **Standard spec. 6105 0094**

| | | | |
|---|---|---|---|
| Used in | SAFUS | 160F660 | Clamp SLZF 70A (5...12 kN) Code 3AFE 5716 8480 |
| | SAFUD | 250F660 | |
| | SAFUC | 250F660<br>400F660<br>630F660<br>1000F660 | Clamp SLZF 89A (7...20 kN) Code 3AFE 5716 8463 |

| Code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 1001 1817 | IR | SD1100C24C-S995 * | 9.8 | 42*15 |

**Note**: In older version of SAFUS 160F660 (code 5743 8932) the diode Siemens / SSIL42120 (code 0980 5575, F = 3 kN) was used. **This diode should not be used.**
Manufacturing of SAFUC 250F660 has been finished.
*** Note**: This diode needs extra plate for the installation. The diode 0980 5613 (2100V/11500A) was used in the apparatuses until 93-10-01.

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**4.9** **$I_{FSM}$ = 34000 A** **Press-pack type**

**$V_{RRM}$ = 2200 V** **Standard spec. 5351 9920**

| | | | |
|---|---|---|---|
| Used in | SAFUC | 1150F460<br>1800F460<br>1250F500<br>2000F500<br>1400F575<br>2100F575<br>1600F660<br>2500F660 | Clamp SLZF 89B (16...30 kN) Code 3AFE 5716 8455 |

| Code | Manufacturer | Type marking | F (kN) | d * h(mm) |
|---|---|---|---|---|
| 3AFE 0980 5907 | Powerex | R9GO-22-22-XX-00 | 20 | 75*27 |
| | Westcode | SW22CXC16C | 30 | 102*33 |

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## 5. REPLACEMENT TABLE FOR FREE-WHEELING DIODES

On the following table are listed the diodes, which are approved as free-wheeling diodes for SAMI STAR. Mechanically they are of press-pack(capsule) or stud type.

LEGEND:

| | |
|---|---|
| $I_{FRM}$ | - Maximum repetitive peak forward current |
| $I_{FSM}$ | - Maximum surge forward current |
| $V_{RRM}$ | - Maximum repetitive reverse voltage |
| T | - Mounting torque in Nm for stud |
| F | - Clamping force in kN for press-pack |
| d * h | - Press-pack diameter * height in mm |
| Case/Th | - JEDEC outline / Thread of stud type device |

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**5.1** **$I_{FSM}$= 600 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1200 V** **Standard spec. 5351 3565**

Free-wheeling diode in SAFUK 80F500
125F500
200F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 0991 6555 | Westcode | SM12PCR074A2P | 4.5 | DO-203 AB | M6 |
| | Semikron | SKN 60 F 12 | 2.5 | DO-203 AB | M6 |
| 3AFE 1000 0505 | Westcode | SM15MCR074B7W * | 2.5 | DO-203 AB | M6 |
| | Semikron | SKN 60 F 15 * | 2.5 | DO-203 AB | M6 |

*** Note:** This diode has $I_{FRM}$= 840 A, $V_{RRM}$= 1500 V (Standard spec. 5812 0332)
**Note:** In the braking choppers, delivered before 89-10-04, the diode BBC / DSD 35-16A was used. **This diode should not be used.**
In the braking choppers, delivered after 93-04-16, this diode (0991 6555) is used no more.
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**5.2** **$I_{FSM}$ = 4000 A** **Press-pack type**

**$V_{RRM}$ = 1300 V** **Standard spec. 5351 7927**

Free-wheeling diode in SAFUI 160F415 Clamp SLZF 61S (2...6 kN)
200F500 Code 3AFE 5719 6815

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0980 5761 | Westcode | SM13CXC174 | 4.5 | 42*15 |

.....

**5.3** **$I_{FRM}$ = 840 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5812 0332**

Free-wheeling diode in SAFUK 80F500
125F500
200F500
100F660
160F660
250F660
250F690

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0505 | Semikron | SKN 60 F 15 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM15MCR074B7W | 2.5 | DO-203 AB | M6 |

**Note:** In the braking choppers, delivered before 89-10-04, the diode BBC / DSD 35-16A was used. **This diode should not be used.**
In the braking choppers, delivered before 93-04-16, the diode 0991 6555 (1200V/600A) was used. **This diode should not be used.**

.....

**5.4** **$I_{FSM}$ = 4000 A** **Press-pack type**

**$V_{RRM}$ = 1700 V** **Standard spec. 5351 7935**

Free-wheeling diode in SAFUI 40F660 Clamp SLZF 61 (2...6 kN)
160F660 Code 3AFE 5717 2321
250F660

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0980 5559 | Westcode | SM18CXC176 | 5.0 | 42*15 |

.....

**5.5** **$I_{FSM}$ = 6000 A** **Press-pack type**

**$V_{RRM}$ = 1700 V** **Standard spec. 5350 8341**

Free-wheeling diode in SAFUI 250F415 Clamp SLZF 61S (2...6 kN)
290F460 Code 3AFE 5719 6815
315F500
340F575
400F660

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 6512 | Westcode | SM16CXC190VR | 6.0 | 42*15 |
| | IR | 851PDE 160L25 | 6.0 | 42*16 |
| | GEC Plessey | DSF45217-6411/1 | 6.0 | 42*15 |

.....

**5.6** **$I_{FSM}$ = 16000 A** **Press-pack type**

**$V_{RRM}$ = 1700 V** **Standard spec. 5351 6823**

Free-wheeling diode in SAFUI 630F415 Clamp SLZF 89B (16...30 kN)
730F460 Code 3AFE 5716 8455
800F500
870F575
1000F660

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0980 5796 | Westcode | SM18CXC924/YP | 23.0 | 74*27 |
| | GEC Plessey | DSF2013SD18 | 23.0 | 74*30 |

.....

**5.7** **$I_{FSM}$ = 16700 A** **Press-pack type**

**$V_{RRM}$ = 1800 V** **Standard spec. 5151 9515**

Free-wheeling diode in SAFUI 400F415 460F460 500F500 540F575 630F660 Clamp SLZF 70B (10...24 kN) Code 3AFE 5716 8471

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0980 5800 | Westcode | SM18CXC805TU | 17.0 | 59*27 |

.....

**5.8** **$I_{FSM}$ = 20000 A** **Press-pack type**

**$V_{RRM}$ = 1700 V** **Standard spec. 6105 9202**

Free-wheeling diode in SAFUI 1000F500 1370F690 Clamp SLZF 142 (16...50 kN) Code 3AFE 5719 8664

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 1001 1892 | Westcode | SM18FXC968 | 30.0 | 102*26 |

## 6. REPLACEMENT TABLE FOR SNUBBER DIODES

On the following table are listed the threaded stud diodes, which are approved as snubber diodes for SAMI STAR frequency converter.

LEGEND:

- $I_{FRM}$ - Maximum repetitive peak forward current
- $I_{FSM}$ - Maximum surge forward current
- $V_{RRM}$ - Maximum repetitive reverse voltage
- T - Mounting torque in Nm
- Case/Th - JEDEC outline / Thread

**6.1** **$I_{FSM}$ = 600 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1200 V** **Standard spec. 5351 3565**

Snubber diode in SAFUI 25F415 40F415 63F415 100F415 32F500 50F500 80F500 125F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 3AFE 0991 6555 | Westcode | SM12PCR074A2P | 4.5 | DO-203 AB | M6 |
| | Semikron | SKN 60 F 12 | 2.5 | DO-203 AB | M6 |
| 3AFE 1000 0505 | Westcode | SM15MCR074B7W* | 2.5 | DO-203 AB | M6 |
| | Semikron | SKN 60 F 15 * | 2.5 | DO-203 AB | M6 |

*** Note:** This diode has $I_{FRM}$= 840 A, $V_{RRM}$= 1500 V (Standard spec. 58120332)
**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSD 35-16A was used. **This diode should not be used.**

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## 6.2 $I_{FSM}$ = 600 A Stud type, cathode to stud

### $V_{RRM}$ = 1200 V Standard spec. 5351 3573

Snubber diode in SAFUI
25F415
40F415
63F415
100F415
32F500
50F500
80F500
125F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 0980 5702 | Westcode | SM12PCN074A2P | 4.5 | DO-203 AB | M6 |
| | Semikron | SKR 60 F 12 | 2.5 | DO-203 AB | M6 |
| 3AFE 1000 0513 | Westcode | SM15MCN074B7R * | 2.5 | DO-203 AB | M6 |
| | Semikron | SKR 60 F 15 * | 2.5 | DO-203 AB | M6 |

*** Note:** This diode has $I_{FRM}$ = 840 A, $V_{RRM}$ = 1500 V (Standard spec. 58120341)
**Note:** In the inverters, delivered before 89-10-03, the diode BBC / DSDI 35-16A was used. **This diode should not be used.**

.....

## 6.3 $I_{FRM}$ = 840 A Stud type, anode to stud

### $V_{RRM}$ = 1500 V Standard spec. 5812 0332

Snubber diode in SAFUI
160F415
250F415
290F460
200F500
315F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0505 | Semikron | SKN 60 F 15 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM15MCR074B7W | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSD 35-16A was used. **This diode should not be used.**
- If the diodes of this type have been connected parallel, see paragraph A in page 26.

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**6.4** **$I_{FRM}$ = 840 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5812 0341**

Snubber diode in SAFUI 160F415
250F415
290F460
200F500
315F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0513 | Semikron | SKR 60 F 15 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM15MCN074B7R | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-03, the diode BBC / DSDI 35-16A was used. **This diode should not be used.**
- If the diodes of this type have been connected parallel, see paragraph A in page 26

.....

**6.5** **$I_{FRM}$ = 2500 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5811 7790**

Snubber diode in SAFUI 400F415
630F415
460F460
730F460
500F500
800F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0343 | Semikron | SKN 141 F 15 | 10 | ----- | M12 |

.....

**6.6** **$I_{FRM}$ = 2500 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5811 7781**

Snubber diode in SAFUI 400F415
630F415
460F460
730F460
500F500
800F500
1000F500 Two diodes parallel

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0335 | Semikron | SKR 141 F 15 | 10 | ------ | M12 |

.....

**6.7** **$I_{FRM}$ = 840 A** **Stud type, anode to stud**

**$V_{RRM}$= 1700 V** **Standard spec. 5812 0324**

Snubber diode in SAFUI 340F575
40F660
160F660
250F660
400F660

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0521 | Semikron | SKN 60 F 17 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM17MCR054B7T | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSD 35-18A was used. **This diode should not be used.**
- If the diodes of this type have been connected parallel, see paragraph B in page 26

.....

**6.8** **$I_{FRM}$ = 840 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5812 0316**

Snubber diode in SAFUI 340F575
40F660
160F660
250F660
400F660

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0530 | Semikron | SKR 60 F 17 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM17MCN054B7S | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSDI 35-18A was used. **This diode should not be used.**
- If the diodes of this type have been connected parallel, see paragraph B in page 26

.....

**6.9** **$I_{FRM}$ = 2500 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5352 9186**

Snubber diode in SAFUI 540F575
870F575
630F660
1000F660

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 3AFE 1000 0165 | Semikron | SKN 141 F 17 | 10 | ------ | M12 |

.....

**6.10** **$I_{FRM}$ = 2500 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5352 9178**

| | | | |
|---|---|---|---|
| Snubber diode in | SAFUI | 540F575 | |
| | | 870F575 | |
| | | 630F660 | |
| | | 1000F660 | |
| | | 1370F690 | Two diodes parallel |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0157 | Semikron | SKR 141 F 17 | 10 | ------- | M12 |

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## 7. REPLACEMENT TABLE FOR CHOPPER DIODES

On the following table are listed the diodes, which are approved as chopper diodes for SAMI STAR frequency converters. Mechanically these diodes are of press-pack (capsule) or stud type.

LEGEND:

| | |
|---|---|
| IFRM | - Maximum repetitive peak forward current |
| IFSM | - Maximum surge forward current |
| VRRM | - Maximum repetitive reverse voltage |
| F | - Clampping force in kN for press-pack type devices |
| T | - Mounting torque in Nm for stud type devices |
| d * h | - Press-pack diameter * height in mm |
| Case/Th | - JEDEC outline / Thread of stud type device |

.....

**7.1** **$I_{FSM}$ = 4000 A** **Press-pack type**

**$V_{RRM}$ = 1300 V** **Standard spec. 5351 7927**

| | | | |
|---|---|---|---|
| Chopper diode (V27) in | SAFUI | 160F415 | Clamp SLZF 61S (2...6 kN) |
| | | 250F415 | Code 3AFE 5719 6815 |
| | | 400F415 | |
| | | 630F415 | |
| | | 290F460 | |
| | | 460F460 | |
| | | 730F460 | |
| | | 200F500 | |
| | | 315F500 | |
| | | 500F500 | |
| | | 800F500 | |
| | | 1000F500 | |
| | | 340F575 | |
| | | 540F575 | |
| | | 40F660 | |

160F660
250F660
400F660
630F660

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0980 5761 | Westcode | SM13CXC174 | 4.5 | 42*15 |

.....

**7.2** **$I_{FRM}$ = 840 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5812 0332**

Chopper diode (V30) in SAFUI
160F415
250F415
400F415
630F415
290F460
460F460
730F460
200F500
315F500
500F500
800F500
1000F500

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0505 | Semikron | SKN 60 F 15 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM15MCR074B7W | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSD 35-16A was used. **This diode should not be used.**

.....

**7.3** **$I_{FRM}$ = 840 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5812 0341**

| | | |
|---|---|---|
| Chopper diode (V28, V29) in | SAFUI | 160F415 |
| (V28, V29) | | 250F415 |
| (V29) | | 400F415 |
| (V29) | | 630F415 |
| (V28, V29) | | 290F460 |
| (V29) | | 460F460 |
| (V29) | | 730F460 |
| (V28, V29) | | 200F500 |
| (V28, V29) | | 315F500 |
| (V29) | | 500F500 |
| (V29) | | 800F500 |
| (V29) | | 1000F500 |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0513 | Semikron | SKR 60 F 15 | 2.5 | DO-203 AB | M6 |

| | | | |
|---|---|---|---|
| Westcode | SM15MCN074B7R | 2.5 | DO-203 AB M6 |

**Note:** In the inverters, delivered before 89-10-03, the diode BBC / DSDI 35-16A was used. **This diode should not be used.**

- If the diodes of this type have been connected parallel, see paragraph C in page 26

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**7.4** **$I_{FRM}$ = 2500 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1500 V** **Standard spec. 5811 7781**

| | | |
|---|---|---|
| Chopper diode (V28) in | SAFUI | 400F415<br>630F415<br>460F460<br>730F460<br>500F500<br>800F500<br>1000F500 |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0335 | Semikron | SKR 141 F 15 | 10 | ------ | M12 |

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**7.5** **$I_{FSM}$ = 6000 A** **Press-pack type**

**$V_{RRM}$ = 1700 V** **Standard spec. 5350 8341**

| | | | | |
|---|---|---|---|---|
| Chopper diode (V27) in | SAFUI | 1000F500<br>870F575<br>1000F660<br>1370F690 | Clamp<br>Code | SLZF 61S (2...6 kN)<br>3AFE 5719 6815 |

| Code | Manufacturer | Type marking | F (kN) | d * h (mm) |
|---|---|---|---|---|
| 3AFE 0991 6512 | Westcode | SM16CXC190VR | 6.0 | 42*15 |

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**7.6** **$I_{FRM}$ = 840 A** **Stud type, anode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5812 0324**

| | | |
|---|---|---|
| Chopper diode (V30) in | SAFUI | 340F575<br>540F575<br>870F575<br>40F660<br>160F660<br>250F660<br>400F660<br>630F660<br>1000F660<br>1370F690 |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0521 | Semikron | SKN 60 F 17 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM17MCR054B7T | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSD 35-18A was used. **This diode should not be used.**

**7.7** **$I_{FRM}$ = 840 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5812 0316**

| | | |
|---|---|---|
| Chopper diode (V28, V29) in | SAFUI | 340F575 |
| (V29) | | 540F575 |
| (V29) | | 870F575 |
| (V28, V29) | | 40F660 |
| (V28, V29) | | 160F660 |
| (V28, V29) | | 250F660 |
| (V28, V29) | | 400F660 |
| (V29) | | 630F660 |
| (V29) | | 1000F660 |
| (V29) | | 1370F690 |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0530 | Semikron | SKR 60 F 17 | 2.5 | DO-203 AB | M6 |
| | Westcode | SM17MCN054B7S | 2.5 | DO-203 AB | M6 |

**Note:** In the inverters, delivered before 89-10-04, the diode BBC / DSDI 35-18A was used. **This diode should not be used.**
- If the diodes of this type have been connected parallel, see paragraph D in page 26

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**7.8** **$I_{FRM}$ = 2500 A** **Stud type, cathode to stud**

**$V_{RRM}$ = 1700 V** **Standard spec. 5352 9178**

| | | |
|---|---|---|
| Chopper diode (V28) in | SAFUI | 540F575 |
| | | 870F575 |
| | | 630F660 |
| | | 1000F660 |
| | | 1370F690 |

| Code | Manuf. | Type marking | T (Nm) | Case | Th |
|---|---|---|---|---|---|
| 3AFE 1000 0157 | Semikron | SKR 141 F 17 | 10 | ------- | M12 |

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## 8. PARALLEL CONNECTED DIODES

In the inverters, delivered before 89-01-01, were used parallel connected diodes as snubber and chopper diodes. On the following table are listed the diodes, which have been used parellel connected. These diodes are selected according to the special requirements (on-state voltage window). Contact ABB Service.

**SNUBBER DIODES**

**A. Diodes 6.3 , 6.4 (1500 V / 840 A)**

| | | |
|---|---|---|
| Two diodes parallel in | SAFUI | 400F415<br>460F460<br>500F500 |
| Three diodes parallel in | SAFUI | 630F415<br>730F460<br>800F500 |

**B. Diodes 6.7 , 6.8 (1700 V / 840 A)**

| | | |
|---|---|---|
| Two diodes parallel in | SAFUI | 570F575<br>630F660 |
| Three diodes parallel in | SAFUI | 870F575<br>1000F660 |

**CHOPPER DIODE (V 28)**

**C. Diode 7.3 (1500 V / 840 A)**

| | | |
|---|---|---|
| Two diodes parallel in | SAFUI | 630F415<br>730F460<br>800F500 |

**D. Diode 7.7 (1700 V / 840 A)**

| | | |
|---|---|---|
| Two diodes parallel in | SAFUI | 870F575<br>1000F660 |