

TopCon TC.GSS.20.500.4WR.S

Programmable Grid-tie Source – Sink
Bidirectional High-Power DC Supply



TopCon GSS Power Supply unit with optional front panel control unit HMI

- TopCon Grid-tie Source Sink technology enables full bidirectional operation
- Compact design with integrated EMI - and Sine filters
- Constant voltage (0 – 100 %), constant current (0 – 100 %) and constant power operation (5 – 100%) with automatic and fast crossover and mode indication. Internal resistance simulation.
- Graduated product line: 65 V_{DC}, 130 V_{DC}, 400 V_{DC}, 500 V_{DC}, 600 V_{DC}, higher voltages with series connection up to 1500 V_{DC}. Power categories of 20 kW and 32 kW are available for each nominal output voltage.
- Optional extras and accessories complete the product line of power supply units.
- Modular concept for easy power increase: Parallel, series, matrix or multiload master-slave-operation.
- High efficiency at a low cost, resulting from the application of innovative IGBT and transformer technology. Primary switched. Galvanic isolated. Full digital control and regulation.
- A user-friendly PC program, the operating and service software TopControl, enables the user to communicate with the power supply.
- TopControl installation file, LabVIEW® and C/C++ C#/I.NET API (DLL file) are included in the scope of delivery.
- CE conformity
- Swiss made: Developed, manufactured and tested

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20 kW / 500 VDC / 50 A

Mains requirements and output specifications

AC lineside ratings

Line voltage / Line current relationship

.....	3 x 380 V _{AC} ± 10 % / 34 Arms ^{1) 3)}
.....	3 x 400 V _{AC} ± 10 % / 32 Arms ¹⁾
.....	3 x 415 V _{AC} ± 10 % / 31 Arms ¹⁾
.....	3 x 440 V _{AC} ± 10 % / 29 Arms ¹⁾
.....	3 x 460 V _{AC} ± 10 % / 28 Arms ¹⁾
.....	3 x 480 V _{AC} ± 10 % / 27 Arms ¹⁾

Line frequency 48 – 62 Hz

Mains connection type 3L+PE (no neutral)

Protective conductor current @ 50 Hz < 20 mA²⁾

Touch current unweighted < 20 mA²⁾

Touch current weighted < 2 mA²⁾

Powerfactor Q1/ Q4-mode ≥ 0.99
(At nominal power)

DC loadside ratings

Power range 0 kW – +/- 20 kW³⁾

Voltage range 0 VDC – 500 VDC

Current range 0 A – +/- 50 A³⁾

Internal resistance range 0 mΩ – 10000 mΩ⁴⁾

Switchable output capacitance 0.09 mF/ 0.9 mF

Operating modes

Q1 mode source mode

Q4 mode regenerative/ sink mode

Voltage regulation (CV) 0 – 100 % U_{max}

Current regulation (CC) 0 – ± 100 % I_{max}

Power regulation (CP) 0 – ± 100 % P_{max}

Static accuracy

Load regulation CV, CC < ± 0.1 % FS⁵⁾

Line regulation CV, CC < ± 0.1 % FS⁶⁾

Transient response time

Load regulation CV < 1.1 ms⁷⁾

Set value tracking CV < 1.1 ms^{8) 11)}

Set value tracking CC:

-With quadrant change < 3 ms⁸⁾

-Without quadrant change < 2 ms⁸⁾

Stability

CV, CC < ± 0.05 % FS⁹⁾

Temperature coefficient

CV < 0.02 % FS / °C¹⁰⁾

CC < 0.03 % FS / °C¹⁰⁾

DC-side ripple Q1 / Q4 Mode

≤ 300 Hz V_{pp} < 0.5 % FS¹¹⁾

≤ 300 Hz V_{rms} < 0.1 % FS¹¹⁾

DC-side noise Q1 / Q4 Mode

40 kHz – 1 MHz V_{pp} < 1 V¹¹⁾

40 kHz – 1 MHz V_{rms} < 0.2 V¹¹⁾

Remote sensing

Terminals on rear side Load voltage drop compensation

- 1) At nominal output power and nominal line voltage. Soft-start to limit turn-on surge currents.
- 2) According to IEC60990: Protective conductor current: 50 Hz component @400 VAC/50Hz/P_{nom}
For weighted touch current: Measured for perception/reaction
Protection with earth leakage circuit breaker possible. An additional PE connection is necessary.
- 3) Current according to the given power limit of the corresponding units. (P = V_{Load} * I_{Load} ≤ 20 kW; for I_{Load} > 40 A --> V_{Load} < 500 V).
Information about derating can be found on page 2.
- 4) The maximum value of the internal resistance is automatically calculated via the DC nominal values
(R_i [mΩ] = V_{Load} / I_{Load} = 500 VDC / 50 A) or limited by the maximum Ri-value: 32000 [mΩ].
- 5) Typical value for 0 – 100 % load variation, at constant line input and temperature conditions.
- 6) Typical value for input voltage variation within 380 VAC ± 10 % – 480 VAC ± 10 %, at constant load and temperature conditions.
- 7) Typical recovery time to within < ± 5 % band of set value for a load step 10 – 90 %, ohmic load, at constant line input and temperature conditions. Transient response time can be slightly affected by multi-unit operation.
- 8) Rise/ fall time for 10%-90% of a set step.
- 9) Maximum drift over 8 hours after 30 minute warm-up time, at constant line input, load and temperature conditions.
- 10) Typical change of output values versus ambient temperature, at constant line input and load conditions.
- 11) Typical value at nominal ohmic load, line asymmetry < 1 V_{rms}.

Non-ohmic loads can lead to deviations in the technical data. All product specifications are subject to change without notification.

Standard programming interfaces**Control port**

Isolation to electronics and earth: 125 Vrms
25 pin D-sub connector, female, on rear panel

Control port input functions

Output voltage off / on 0 / 24 VAC / DC
2 digital application inputs 0 / 24 VAC / DC ¹⁾
Interlock circuit 0 / 24 VDC
Voltage setting 0 – 100 % 0 V – 10 V
Current setting -100% – 100 % -10 V – 10 V
Power setting 0 – 100 % +10 V – 0 V ⁴⁾
Int. resistance setting 0% – 100% 0 V – 10 V

Control port output functions

Unit ready / error Relay contact
Output voltage on Relay contact
Warnings Relay contact
Actual voltage readback 0 – 100 % 0 V – 10 V
Actual current readback -100 % – 100 %
..... -10 V – 10 V
Resolution (programming and readback):
U, I, P, Ri 0.2 % FS

RS232

9 pin D-sub connector, female, on front panel
Isolation to electronics and earth 125 Vrms
Baud rate 38400 baud
Resolution (programming and readback):
U, I 0.025 % FS
P, Ri 0.1 % FS

Ordering Information**Ordering code**

TC.GSS.20.500.4WR.S(.Option)

Standard Scope of delivery

TopCon power supply unit ready to install, including:
..... Operating manual (English or German)
..... RS232 cable 1.8 m
..... Installation disc TopControl,
..... LabVIEW® and C/C++; C#/ .NET API (DLL file)

Options**Front panel control unit HMI**

Integrated control, programming and display unit with
graphic LC-Display, select wheel, push buttons and
interactive text menus
Languages (switchable) English, German
Display resolution:
U 4 digits
I 3 digits
P Kilowatt + 1 decimal digit
Ri 1 mΩ

Remote control unit RCU

Specifications same as HMI, available in 2 versions:
..... desk top and 19" rackmount
max. cable length 40 m
Desk top W x H x D 355 x 100 x 290 mm
19" rackmount W x H x D 483 x 88 (2 U) x 290 mm

Further options

TFEAAP ¹⁾ Function Generating Engine
Time-based and
parametric programming
SASControl ¹⁾ SAS application program
including TFEAAP
BatControl ¹⁾ Battery application program
BatSim ¹⁾ Battery simulation program
CapSim ¹⁾ Capacitor simulation program
RS232REAR ²⁾ RS-232 on front and rear panel
USB ³⁾ USB on rear panel
RS422 ²⁾ RS-422 on rear panel
ETHERNET ³⁾ Ethernet on rear panel
IEEE ³⁾ GPIB/ IEEE488.2/ SCPI on rear panel
... cannot be combined with CANOPEN nor with USB
CANOPEN ³⁾ CAN/ CANOPEN on rear panel
CANmp CANmp on rear panel
OptoLink ³⁾ OptoLink on rear panel
CANCABLE Connecting cable
..... for Multi-Unit Operation or RCU: 2, 5, 10 m
PACOB Protection against accidental contact
LCAL Integrated liquid cooling of the power
stage, inlet / outlet on rear side, size G 1/2"
AIRFILTER ⁵⁾ Front panel airfilter 9 U
ISR 2 channel Integrated Safety Relay
NSOV Non-Standard output voltage (if possible)

- 1) Customer-specifically programmable.
- 2) This option and RS232: time-shared mode required, if used together.
- 3) RS232 only on Rear Panel.
- 4) Bipolar power settings -10 V... +10 V possible with software configuration change
- 5) Information about derating can be found on page 2.