



GCP-20 Series

Genset Control Package

Mains & Generator Protection & Control

APPLICATIONS

The GCP-20 Series genset control is designed to provide total control for stand-alone and multiple unit applications in isolated or mains parallel operation.

There are three GCP-20 Series Packages available for various genset applications. The GCP-20 is designed for stand-by gensets. Open or closed transition power transfers including logic for two circuit breakers. The GCP-21 is designed for continuous parallel operation and has control logic for one circuit breaker. The GCP-22 has control logic for two circuit breakers that enable automatic power transfers like open transition, closed transition and softloading.

Load management features include automatic base/peak shaving, import/export control and emergency power/back up power generation.

DESCRIPTION

Features (all versions)

- True RMS voltage (generator/busbar/mains)
- True RMS current (generator/mains)
- Start/stop logic for Diesel/Gas engines
- Engine pre-glow or purge control
- Battery voltage monitoring
- Speed control with overspeed monitoring
- kWh/oper.hours/start/maintenance counter
- Configurable trip/control set points
- Configurable delays for each protection
- Speed input (magnetic/switching pickup, MPU)
- 14 configurable discrete alarm inputs
- 4 configurable/programmable relays
- Two-line LC display
- Push-buttons for direct control
- Multi-level password protection

Controller (all versions)

- Speed/frequency/voltage
- Isolated operation

DESCRIPTION (continued)

Protection (all versions) ANSI

Mains

- Over-/undervoltage (59/27)
- Over-/underfrequency (810/U)
- Phase/vector shift (78)

Generator

- Over-/undervoltage (59/27)
- Over-/underfrequency (810/U)
- Overload/reverse power (32/32R)
- Unbalanced load (46)
- Independent time-overcurrent (50/51)

GCP-20 (unique features)

Synchronizer for GCB and MCB

- Automatic Mains Failure (AMF) operation
- Open transition (break-before-make)
- Closed transition (make-before-break)

GCP-21/-22 (unique features)

Synchronizer for GCB

- Real power/power fact. (cosphi) control
- Mains parallel operation
- Mains import/export power control
- Reduced power monitoring (32F)
- Load dependent start/stop
- Load/var sharing (up to 8 units)

GCP-22 (unique features)

Synchronizer for GCB and MCB

- Automatic Mains Failure (AMF) operation
- Open transition (break-before-make)
- Closed transition (make-before-break)
- Softloading

Special (Version dependent)

- 2 configurable analog outputs (0/4 to 20 mA)
- Generator real power setpoint via 0/4 to 20 mA
- Discrete raise/lower for n/f/V/P/Q *
- Analog raise/lower for n/f/V/P/Q *
- 3 conf. analog alarm inp. (0/4 to 20 mA, VDO)
- CAN bus communication

* n = speed; f = frequency; V = voltage;
P = real power; Q = reactive power

- Complete engine, generator, and mains protection and controller into one unit
- AMF auto start/stop
- True RMS sensing
- Synchronization for one/two breakers
- Load management-automatic base load/peak shaving, import/export power control
- Automatic start/stop sequencing
- Load/var sharing
- Counters for kWh, engine starts, operating hours, maintenance call
- Freely configurable discrete and analog alarm inputs
- Freely configurable relay and analog outputs
- PC and front panel configurable
- CAN bus communication
- CE marked
- UL/cUL Listed

SPECIFICATIONS

Accuracy Class 1
Power supply 12/24 Vdc (9.5 to 32 Vdc)
Intrinsic consumption max. 15 W
Ambient temperature -20 to 70 °C
Ambient humidity 95 %, non-condensing

Voltage Rated λ/Δ : [1] 66/115 Vac or [4] 230/400 Vac
Maximum value (V_{max}): [1] 150 Vac or [4] 300 Vac
Rated voltage $V_{ph-ground}$: [1] 150 Vac or [4] 300 Vac
Rated surge voltage: [1] 2.5 kV or [4] 4.0 kV
Measuring frequency 50/60 Hz (40 to 70 Hz)
Linear measuring range up to $1.3 \times V_{rated}$
Input resistance [1] 0.21 M Ω , [4] 0.7 M Ω
Max. power consumption per path < 0.15 W

Current (rated value) [5] ..5 A
Linear measuring range up to $I_{Gen} = 3.0 \times I_{rated}$
 $I_{Mains} = 1.5 \times I_{rated}$
Load < 0.15 VA
Rated short-time current (1 s) [5] $10 \times I_{rated}$

Discrete inputs isolated
Input range 12/24 Vdc (4 to 40 Vdc)
Input resistance approx. 6.7 k Ω

Analog inputs freely scaleable
Type 0/4 to 20 mA, VDO
Resolution 10 Bit

Relay outputs isolated
Contact material AgCdO
Load (GP) 2.00 Aac@250 Vac
2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
Pilot duty (PD) 1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc

Analog output isolated
Type 0/4 to 20 mA, freely scaleable
Resolution 8/12 Bit (depending on model)
Max. load 0/4 to 20 mA 500 Ω
Insulating voltage 3,000 Vdc

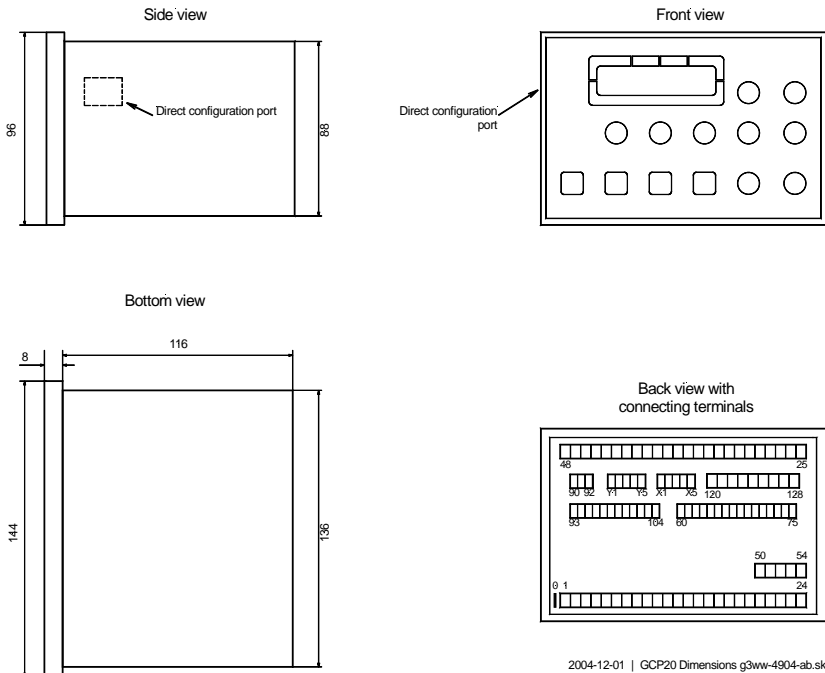
Housing Type APRANORM DIN 43 700
Dimensions 144x96x118 mm
Front cutout 138 [+1.0] x 92 [+0.7] mm
Connection screw/plug terminals depending on connector 1.5 mm² or 2.5 mm²
Front insulating surface

Protection system with correct installation
Front IP42 (sealed IP54; gasket kit = P/N 8923-1038)
Back IP21
Weight depending on version, approx. 1,000 g

Disturbance test (CE) tested according to applicable EN guidelines

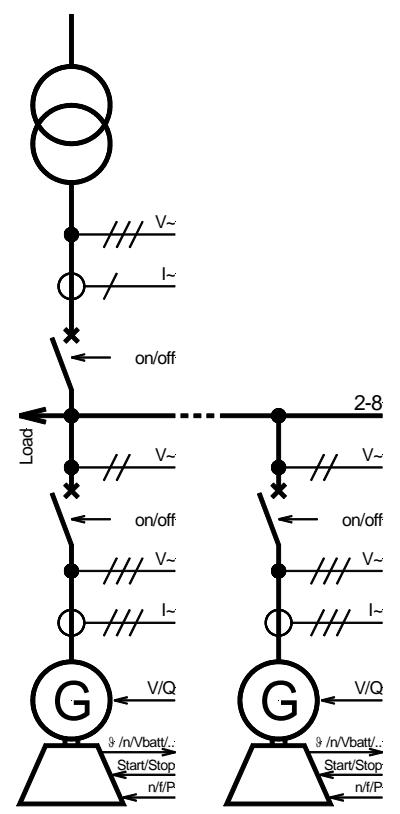
Listings UL/cUL listed (File No.: E231544)

DIMENSIONS



APPLICATIONS

Typical application for the GCP-22 (GCP-21 same but without MCB)



FEATURES OVERVIEW

| GCP-20 Series Genset Control | GCP-20 | | GCP-21 | | | GCP-22 | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|
| | Package | LS | LS | LSB | LSR | LSX | LS | LSB | LSR | LSX |
| Control | | | | | | | | | | |
| Breaker control logic | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Synchronization | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Isolated single-unit operation | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| AMF (auto mains failure operation) | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| Stand-by operation | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| CHP (combined heat & power) operation | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Peak load operation (auto start/stop) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mains parallel operation | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Open transition (break-before-make) | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| Closed transition (make-before-break) | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| Softloading | | ✓#1 | ✓#1 | ✓#1 | ✓#1 | ✓#1 | ✓ | ✓ | ✓ | ✓ |
| Accessories | | | | | | | | | | |
| Start/stop logic for Diesel/Gas engines | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| kWh counter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Operating hours/start/maintenance counter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Configuration via PC #2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Protection | | | | | | | | | | |
| Generator: voltage/frequency | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mains: volt./freq./phase shift | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Generator: overload | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Generator: reverse power | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Generator: reduced power | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Generator: unbalanced load | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Generator: independent time-overcurrent (TOC) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controller | | | | | | | | | | |
| Discrete raise/lower: n/f (speed/frequency) | ✓ | ✓ | | | | | ✓ | | | |
| Discrete raise/lower: V (voltage) | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | |
| Discrete raise/lower: P (real power) | | ✓ | | | | | ✓ | | | |
| Discrete raise/lower: Q (reactive power) | | ✓ | | | ✓ | | ✓ | | ✓ | |
| Analog raise/lower: n/f (+/-3 Vdc) | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Analog raise/lower: V (+/-5 Vdc) | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Analog raise/lower: P (+/-3 Vdc) | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Analog raise/lower: Q (+/-5 Vdc) | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Mains import/export power (current measurement) | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Load-dependent start/stop | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Real power setpoint value: 0/4 to 20 mA [T3] | | | | | | ✓ | | | | ✓ |
| Load/var sharing | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| I/Os | | | | | | | | | | |
| Speed input (magnetic/switching Pickup) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Discrete alarm inputs (configurable) | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Relay outputs (configurable) | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Analog inputs (configurable) | | | | 4 #3 | 3 #4 | | | | 4 #3 | 3 #4 |
| Analog outp. 0/4 to 20 mA (configurable) | | | | | 2 | | | | | 2 |
| CAN bus communication #5 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Listings/Approvals | | | | | | | | | | |
| CE marked | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UL/cUL listed | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Product number P/N | | | | | | | | | | |
| 100 Vac, ..5 A | 8440-1581 | 8440-1586 | 8440-1541 | 8440-1346 | 8440-1587 | 8440-1590 | 8440-1103 | 8440-1052 | 8440-1591 | |
| 400 Vac, ..5 A | 5448-918 | 5448-916 | 8440-1014 | 5448-915 | 8440-1013 | 5448-914 | 8440-1012 | 5448-913 | 8440-1011 | |

#1 In isolated parallel operation with min. 2 gensets in parallel

#2 Cable incl. software necessary (DPC)

#3 [T1]= VDO 0 to 5/10 bar; 0 to 180 Ohm; [T2] = VDO 40 to 120°C; 0 to 380 Ohm; [T3] & [T4] = 0/4 to 20 mA; freely scaleable

#4 [T1]= VDO 0 to 5/10 bar; 0 to 180 Ohm; [T2] = VDO 40 to 120°C; 0 to 380 Ohm; [T4] = 0/4 to 20 mA; freely scaleable

#5 Remote monitoring, control, configuration (GW 4 could be used for several interfaces)

WIRING DIAGRAM (GCP-22; refer to manual for GCP-20 and GCP-21)

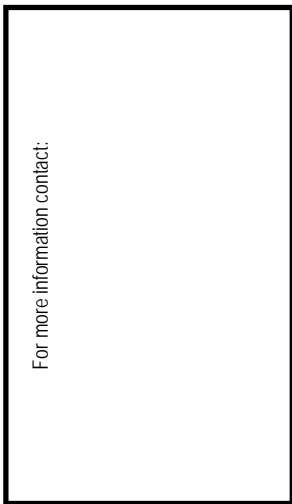
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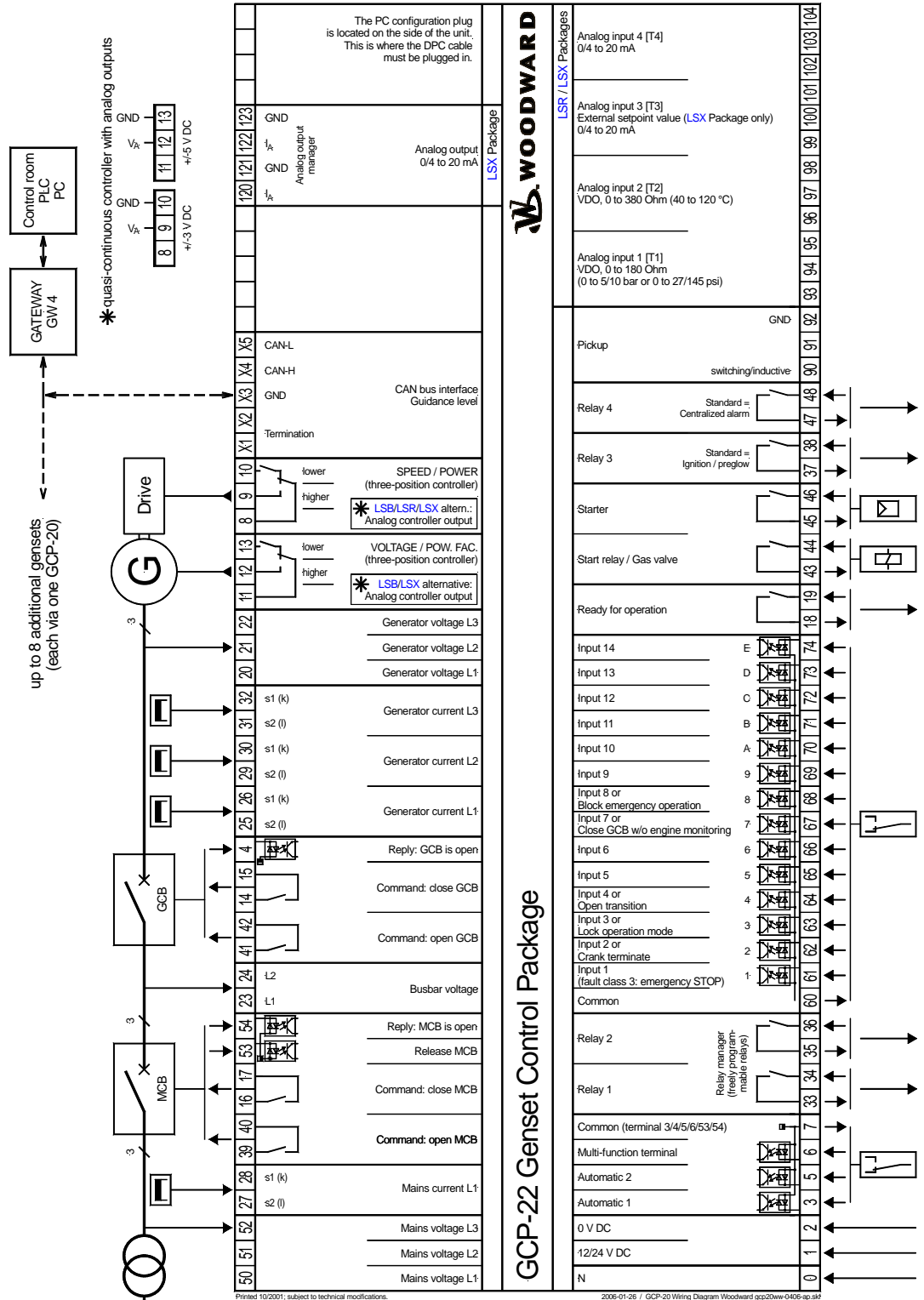
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