



# 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  $\lambda/\Delta$ : [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 $\Omega$ , [4] 0.7 M $\Omega$   
 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 $\Omega$

**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

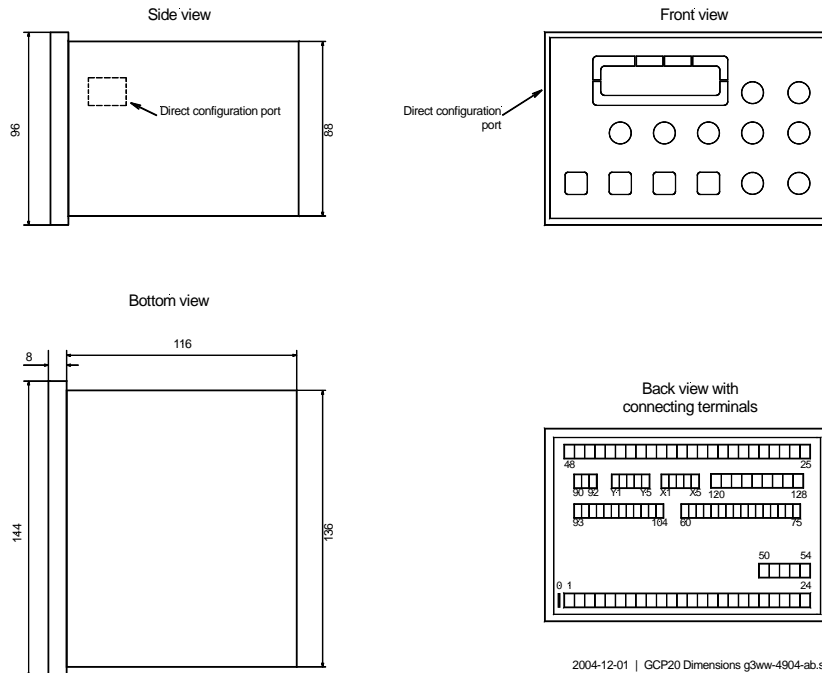
**Analog output** ..... isolated  
 Type ..... 0/4 to 20 mA, freely scaleable  
 Resolution ..... 8/12 Bit (depending on model)  
 Max. load 0/4 to 20 mA ..... 500  $\Omega$   
 Insulating voltage ..... 3,000 Vdc

**Housing** ..... Type APRANORM DIN 43 700  
 Dimensions ..... 144×96×118 mm  
 Front cutout ..... 138 [+1.0] × 92 [+0.7] mm  
 Connection ..... screw/plug terminals depending on connector 1.5 mm<sup>2</sup> or 2.5 mm<sup>2</sup>  
 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

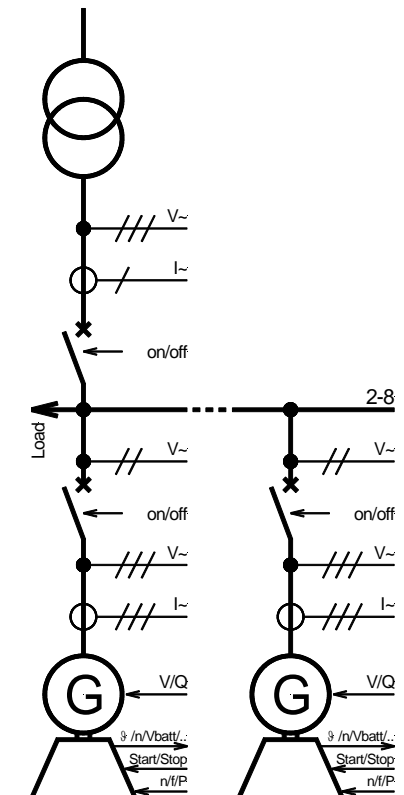
**Disturbance test** (CE) ..... tested according to applicable EN guidelines  
 Listings ..... UL/cUL listed (File No.: E231544)

# 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
<b>Control</b>										
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	✓	✓	✓	✓
<b>Accessories</b>										
Start/stop logic for Diesel/Gas engines	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
kWh counter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating hours/start/maintenance counter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Configuration via PC #2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Protection</b>										
Generator: voltage/frequency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mains: volt./freq./phase shift		✓	✓	✓	✓	✓	✓	✓	✓	✓
Generator: overload	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Generator: reverse power	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Generator: reduced power		✓	✓	✓	✓	✓	✓	✓	✓	✓
Generator: unbalanced load	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Generator: independent time-overcurrent (TOC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Controller</b>										
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		✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>I/Os</b>										
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		✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Listings/Approvals</b>										
CE marked	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL/cUL listed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Product number P/N</b>										
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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For more information contact:



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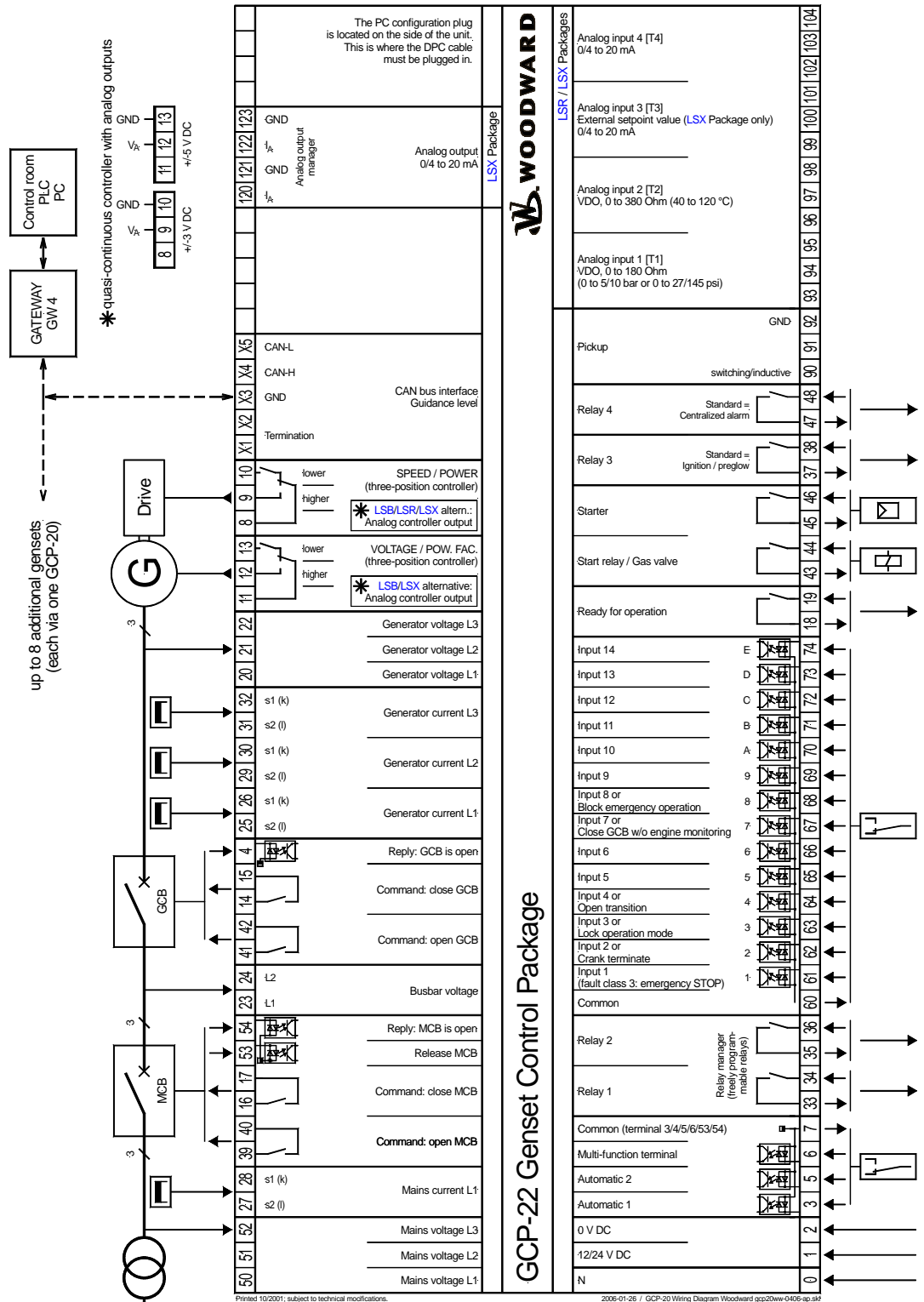
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