



GCP-31 RPO+SC09

Rental Package Mains & Generator Protection & Control

APPLICATIONS

The GCP-31 RPO+SC09 gset control is designed to meet the needs of the rental generator market. This control permits the operator to change the operating voltage, frequency, and generator configuration and protection schemes via discrete inputs..

Up to **8** gensets may be controlled through a network of GCP-31 RPO controllers. Load management features include isochronous load and var sharing, load-dependent start/stopping and emergency power/back up power generation

The GCP-31 has logic for one/two circuit breaker including open/closed transition and soft power transfer. Fully integrated communication to engine ECUs including [via CAN bus] standard SAE J1939, Deutz EMR, Scania S6, Volvo EMS2, mtu ADEC, mtu MDEC.

DESCRIPTION

Features

- True RMS 8x voltage (generator/busbar/mains)
- True RMS 4x current (generator/mains)
- Start/stop sequence for Diesel/Gas engines
- Engine pre-glow or purge control
- Battery voltage monitoring
- Speed control with overspeed monitoring
- Idle speed mode operation
- kWh/operation hours/start/maintenance counter
- Load dependent start/stop for up to **8 generators**
- Configurable trip/control set points
- Configurable delays for each protection/alarm
- Up to four voltage schemes selectable via DIs
- Two frequencies selectable via discrete input
- Magnetic/switching Pickup input
- Up to 12 configurable discrete alarm inputs
- 7 configurable/programmable relays
- Two-line LC display
- Synchroscope
- Push-buttons for direct control
- CAN bus communication
- Multi level password protection
- Language manager (English/German selectable)
- Slip synchronization / phase matching

DESCRIPTION (continued)

Protection ANSI

- 3/4-line measurements
- Mains**
 - Over-/undervoltage (59/27)
 - Over-/underfrequency (81O/U)
 - Phase/vector shift (78)
- Generator**
 - Over-/undervoltage (59/27)
 - Over-/underfrequency (81O/U)
 - Overload (32)
 - Reverse/reduced power (32R/F)
 - Unbalanced load (46)
 - Time-overcurrent (TOC) (50)

Controller

- Speed/frequency/real power
- Voltage/power factor cosphi
- Mains import/export power
- f/V droop via DI
- Load/var sharing for up to **8 generators**
- Isolated operation
- Soft-loading
- Mains parallel operation
- Open transition (break-before-make)
- Closed transition (make-before-break)
- 2 DIs for frequency / real power set point
- 2 DIs for voltage / power factor set point
- 2 configurable analog outputs (0/4 to 20 mA)
- Generator real power setpoint via 0/4 to 20 mA
- Mains import/export power via 0/4 to 20 mA
- Discrete outputs raise/lower for n/f/V/P/Q
- Analog outputs raise/lower for n/f/V/P/Q
- PWM outputs raise/lower for n/f/P
- 7 conf. analog measuring inputs (0/4 to 20 mA, Pt100, VDO-+)
- Event recorder with real time clock

SYNCONpanel mode

- This unit may be controlled by the SYNCONpanel (see Product Specifications 37185 for details)

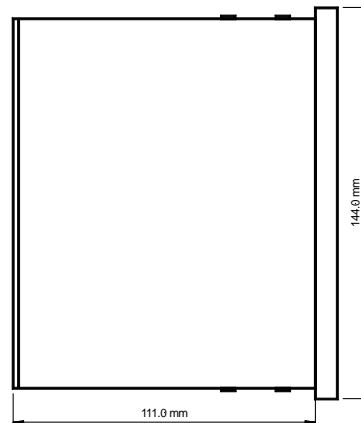
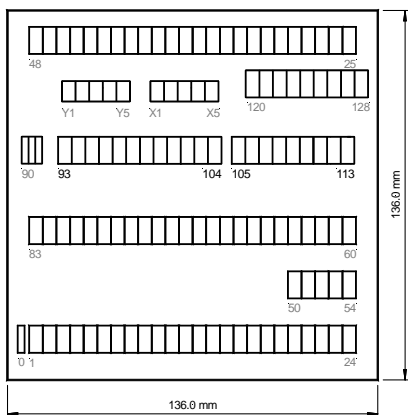
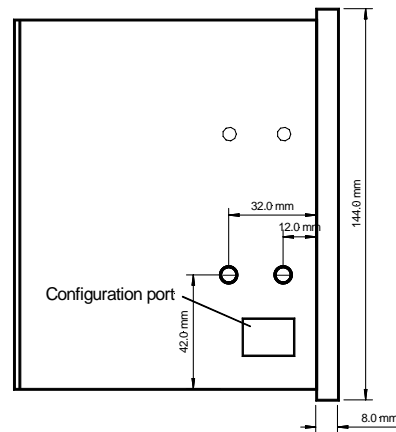
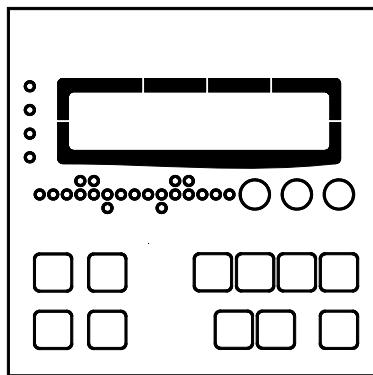
- **J1939** (Volvo EMS2, mtu ADEC, Scania S6, Deutz EMR), mtu **MDEC** communications
- High wye, low wye, and delta configurations possible via discrete inputs
- Complete engine, generator, and mains protection and controller in one unit
- True RMS sensing of generator, busbar and mains voltage as well as generator and mains current
- Synchronization for one/two breakers
- Load management-automatic base load/peak shaving, import/export power control, automatic sequencing
- Load/var sharing for up to **8 generators** incl. auto start/stop
- Counters for kWh, engine starts, operating hours, maintenance call
- Analog inputs for oil pressure, coolant temperature, and fuel level
- Freely configurable discrete and analog alarm inputs
- Freely configurable relay and analog outputs
- PC and front panel configurable
- CAN bus based communication
- CE marked
- UL/cUL Listed

SPECIFICATIONS

Accuracy	Class 1
Power supply	12/24 Vdc (9.5 to 32 Vdc)
Intrinsic consumption	max. 20 W
Ambient temperature	Operation: -20 to 70 °C
	Storage: -40 to 80 °C
Ambient humidity	95 %, non-condensing
Voltage	Rated (V_{rated}): 231/400 Vac
	V_{ph-ph} max. (UL): max. 173/300 Vac
	Rated $V_{ph-ground}$: 300 Vac
	Rated surge voltage: 4.0 kV
	Setting range (prim.): 0.050 to 65.000 kVac
Measuring frequency	50/60 Hz (40 to 70 Hz)
Linear measuring range up to	$1.3 \times V_{rated}$
Input resistance	0.7 M Ω
Max. power consumption per path	< 0.15 W
Current (rated values; I_{rated})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)	$10 \times I_{rated}$
Discrete inputs	isolated
Input range	12/24 Vdc (6 to 32 Vdc)
Input resistance	approx. 6.8 k Ω
Analog inputs	freely scaleable
Type	0/4 to 20 mA, Pt100, VDO
Resolution	10 Bit

Relay outputs	potential free
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 Aac@250 Vdc
	1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Analog outputs	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	1,500 Vdc
Housing	Type APRANORM DIN 43 700
Dimensions	144x144x118 mm
Front cutout	138[+1.0]x138[+1.0] mm
Connection	screw/plug terminals depending on connector 1.5 mm ² or 2.5 mm ²
Front	insulating surface
Protection system	with proper installation
	Front
	IP42
	(sealed IP54; gasket kit = P/N 8923-1039)
	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)

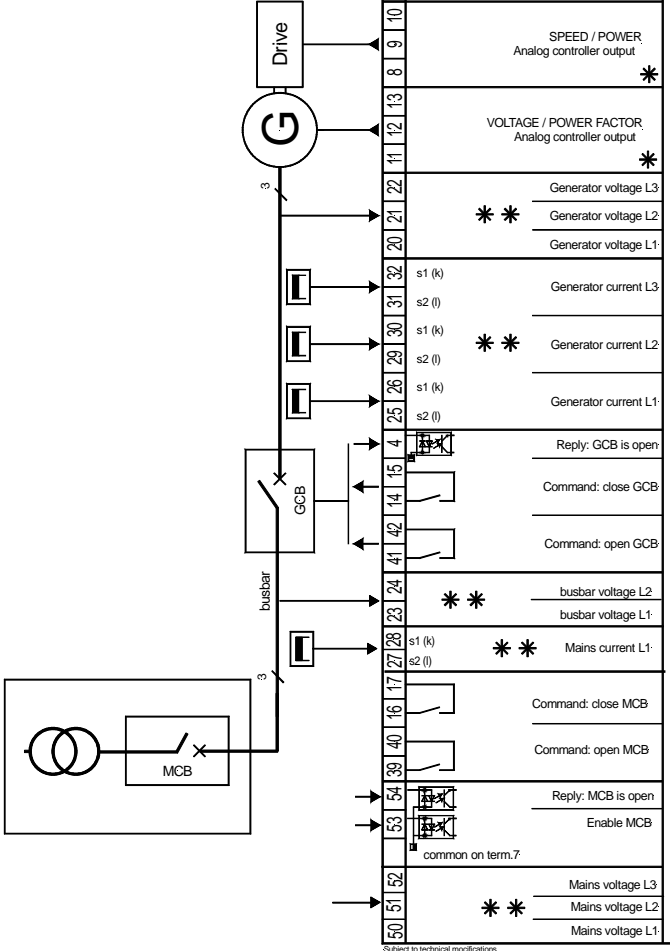
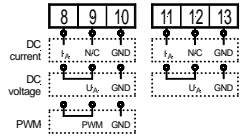
DIMENSIONS



WIRING DIAGRAM

* * Attention! The wiring of the measurement inputs is shown for a three-phase operation. If a single-phase operation is selected, a different wiring of the measurement inputs is required. (See Installation Manual 37366 - 'Measuring Inputs' chapter)

* quasi-continuous controller with analog outputs (three-position controller via relay manager; ext. R/C connection)



GCP-31 RPQ+SC09 Genset Rental Package

Operating Mode Automatic	127		
Operating Mode STOP	126		
Mobile System Mode	125		
f/v Droop active	124		
GND	123		
Analog output manager	122		
Analog output 0/4 to 20 mA	121		
GND	120		
CAN-L	X4		
CAN-H	X3		
GND	X2		
Termination	X1		
CAN-L	Y5		
CAN-H	Y4		
GND	Y3		
Termination	Y2		
Analog input 7 [T7] VDO, 0 to 380 Ohm [40 to 120°C or alternatively 86 to 248°F]	113		
Analog input 6 [T6] VDO, 0 to 180 Ohm [0 to 5 or 0 to 10 bar or alternatively 0 to 72/145psi]	112		
Analog input 5 [T5] VDO, 0 to 400 Ohm [fuel level]	111		
SPEED / POWER Analog controller output	110		
VOLTAGE / POWER FACTOR Analog controller output	109		
Generator voltage L3	108		
Generator voltage L2	107		
Generator voltage L1	106		
Generator current L3	105		
Generator current L2	104		
Generator current L1	103		
Reply: GCB is open	102		
Command: close GCB	101		
Command: open GCB	100		
busbar voltage L2	99		
busbar voltage L1	98		
Mains current L1	97		
Command: close MCB	96		
Command: open MCB	95		
Reply: MCB is open	94		
Enable MCB	93		
common on term.7	92		
Mains voltage L3	91		
Mains voltage L2	90		
Mains voltage L1	89		
Analog input 4 [T4] Pt100 [0 to 200°C]	104		
Analog input 3 [T3] 0/4 to 20 mA	103		
Analog input 2 [T2] 0/4 to 20 mA	102		
Analog input 1 [T1] 0/4 to 20 mA	101		
GND -	92		
MPU input (Magnetic Pickup Unit)	91		
switching/inductive +	90		
Relay 7 Standard = Centralized alarm	48		
Relay 6 Standard = Ignition / preglow	38		
Relay 5	37		
Relay 4	82		
Relay 3	83		
Relay 2	81		
Relay 1	80		
Starter (crank)	79		
Start relay / Gas valve	78		
Ready for operation	77		
Voltage selection	76		
Voltage selection	75		
Frequency 2 active	74		
Alarm input 13 or Idle active	73		
Alarm input 12 or V/power factor set point raise	72		
Alarm input 11 or blocking emergency run	71		
Alarm input 10 or V/power factor set point lower	70		
Alarm input 9 or I/P set point raise	69		
Alarm input 8 or I/P set point lower	68		
Alarm input 7 or change breaker logic	67		
Alarm input 6 or Mode selection locked	66		
Alarm input 5 or Dynamo/Pressure	65		
Alarm input 4 or 1/3-phase measurement selection	64		
Common	63		
Phase Rotation Check O.K.	62		
Alarm input 2	61		
Alarm input 1 (recommended: emergency stop)	60		
Common	59		
Common (terminal 3/4/5/6/53/54)	58		
Multi function terminal	57		
Automatic 2	56		
Automatic 1	55		
0 Vdc	54		
12/24 Vdc	53		
Neutral / chassis ground	52		

The socket for the PC configuration is located on the side of the unit. This is where the DPC has to be plugged in.

Voltage	9 0	System 1
	0 1	System 2
	1 0	System 3
	1 1	System 4

M¹ = configurable during setup (N/C/N) P¹ = Battery or another power supply; terminal 60 is pos. or neg. signal

Subject to technical modifications.

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FEATURES OVERVIEW

GCP-31 RPQ+SC09	
Genset Control	
Control	
Breaker control logic	2
Synchronization	✓
Isolated single-unit operation	✓
AMF (auto mains failure operation)	✓
Stand-by operation	✓
Peak load op. (auto start/stop)	✓
Mains parallel operation	✓
Open transition (break-before-make)	✓
Closed transition (make-before-break)	✓
Softloading	✓
SYNCONpanel mode	✓
Accessories	
Start/stop logic for Diesel/Gas engines	✓
kWh counter	✓
Operating hours/start/maintenance counter	✓
Configuration via PC #1	✓
Event recorder, real time clock	50
Language manager (English/German)	✓
Protection	
Generator: voltage/frequency	✓
Mains: volt./freq./phase shift	✓
Generator: overload/unbalanced load	✓
Generator: reverse/reduced power	✓
Generator: time-overcurrent (TOC)	✓
Controller	
Discrete raise/lower: n/f & P	✓ #2
Discrete raise/lower: V & power factor	✓ #2
Analog raise/lower: n/f & P #2	✓
Analog raise/lower: V & Q #2	✓
PWM raise/lower: n/f & P #2	✓
f/V droop via DI	✓
Mains import/export power via 20 mA	✓
Mains import/export power control	✓
Load-dependent start/stop	✓
Active power setpoint 0/4 to 20 mA #3	✓
Load/var sharing for 8 generators	✓
I/O's	
Selectable frequencies via discrete input	2
Selectable voltages via discrete inputs	4
Magnetic/switching Pickup	✓
Discrete alarm inputs (configurable)	12
Relay outputs (configurable)	7
Analog inputs (configurable) #3	7
Analog outputs 0/4 to 20 mA (config.)	2
External operation mode selection via DI	✓
CAN bus comm., Guidance level #4	✓
CAN bus comm., Engine level #5	✓
Listings/Approvals	
CE Marked	✓
UL/cUL Listed	✓
Part numbers P/N	
Measuring inputs 400 Vac, ..5 A	8440-1764

- #1 Cable incl. software necessary (DPC)
- #2 +/-20 mA and +/-10 Vdc and PWM signal (type and range configurable); bias/discrete setpoint via relay manager
- #3 [T1]-[T3] = 0/4 to 20 mA, [T4] = Pt100, [T5] = VDO fuel level, [T6] = VDO 0 to 180ohm, [T7] = VDO 0 to 380ohm; function of 20 mA inputs is configurable between alarm input, remote setpoint value for generator real power, mains import/export real power measuring value; others upon request
- #4 Remote monitoring, control, configuration (GW 4 could be used for several interfaces)
- #5 CAN bus connection to IKD1, mtu MDEC, mtu ADEC, Volvo EMS2, Scania EMS/S6, Deutz EMR2, AN SAE J1939

APPLICATION

Typical application for the GCP-31 RPQ+SC09

