SICES®
Empowering your control

NEW

EASY-Synchro

Synchro/Parallel control panel in modular version for gensets up to 1000kVA

EASY-Synchro is an electric control panel in modular version aimed for the management of **Generator Sets running in Synchro/Parallel mode**.

Just one panel to keep in stock able to fit for different type of power plants like:
MPM (Multiple Prime Mover)
MSB (Multiple Stand-by)
SPtM (Single Parallel to Mains)
MPtM (Multiple Parallel to Mains)

This solution offers **maximum flexibility** matching different types of requirements:

- **Modularity of the system**
- **Different engine interfaces (Volvo, Perkins, MTU, etc...)**
- **Quick Set Up, using the proper instructions already included!**
- **Multi voltage operation 220V - 380V - 400V - 440V**
- **Double frequency: 50Hz - 60Hz**

EASY-Synchro is available with or without motorized circuit breaker.

High quality standard
Plug&Play control panel
Good price level
Easy installation
Made in Italy

General info

EASY-Synchro is a ***smart synchro/parallel panel*** *studied for the management of gensets working in synchro/parallel applications.* ***The same panel can be used for both emergency and production power systems whose gensets work in island mode or in parallel with the mains.***

EASY-Synchro is plug&play solution which can be used for several and different gensets having various engine interfaces.

Thanks to the quick instructions set-up it's possible to combined EASY-Synchro to any kind of gensets.

EASY-Synchro is in fact studied to offer a smart and flexible solution due to ***the same panel is able to cover a wide range of requests and applications.***

The panel includes the main engine and alternator protections and all the functions for the synchronization, the ***load management****, the* ***load sharing*** *for island mode paralleling operations.*

In addition, the controller includes the ***reactive power (VAR) module*** *for the management of those gensets in parallel with the mains.*

EASY-Synchro is available with or without the power circuit. In case of the power circuit is demanded, a motorized genset circuit breaker is already mounted and wired. A set of proper sized CTs is provided for the alternator measures.

At the moment, the max current of the motorized circuit breaker available is 1600A (suitable for max 1000kVA at 400V).

The control panel is made in a steel sheet carpentry with painting treatment using high resistance epoxy powder, colour RAL7035.

The external protection degree with closed door is IP40. with opened door the protection degree is IP20.

Operation sequence – Island mode (*)

The control panel allows a system that, by machine operator, it starts the engine, synchronizes the genset, sends the command of closure to the proper circuit breaker enabling the engine to run in parallel with other gen sets having compatible controllers.

The system, using the Canbus connection among the control units, allows an automatic load sharing system: the power is equally supplied by the Gensets.

After an adjustable delay, if the proper circuit is inserted (by selector switch), the Control Panel checks the real requested electric power. In case it can be supplied by a single genset, the genset not selected as "master" will be deactivated.

In case of load increasing, the system allows the starting of the stand-by genset, that automatically works again in parallel to the master genset.

All the activation and deactivation delays, as well as the power thresholds levels, can be adjusted directly on the Genset controller GC500^{Plus}.

Note: In case of the power plant comprises stand-by gensets ready to start in case of mains failure, the switch Mains/Genset is managed by an external logic. The genset control panel gets a contact to start to run or stop the genset. At terminal board two free voltage contacts are provided for signaling "Genset circuit breaker closed" and "Genset not available".

Priority management of gensets

There are different management systems which define conditions and priorities for ON/OFF of Gensets according to the load.

1. **Manual Management**
2. **Rotation scheme based on fixed time**
3. **Rotation scheme based on time intervals**

These priorities may even be excluded by the operator keeping all the Gen Sets ON independently from the load.

1. MANUAL MANAGEMENT

With this mode the operator can set the Master Gen Set which will be always ON, when required.

Based on the request of load, the other Gen Sets start or stop depending on the load measured on mains and, also, depending on the default priorities given by the operator himself.

2. ROTATION SCHEME BASED ON A FIXED TIME

The Master genset is automatically selected by the genset controller based on a fixed timing per day. Thus the master genset periodically changes.

3. ROTATION SCHEME BASED ON TIME INTERVALS

The Master genset is changed after the previously set elapsed time.

Operation sequence in case of Mains Synchro/Parallel (*)

The activation command, by operator or remote control, provides the following actions:

1. Genset activation;
2. Control of the synchronization between the Genset and the Mains;
3. Closure of the genset circuit breaker (GCB) after checking the reached conditions;
4. Ramp power until a settable value;
5. In case of a failure on the line, the control panel checks the opening of the Mains Circuit Breaker (MCB).
6. When the Mains values are into the normal limits, the control panel starts again the synchro operation between genset and mains, closing the MCB once again and supply the power.

The deactivation command, provides the following actions:

7. The gradual reduction of the supplied power until zero;
8. Opening of the GCB;
9. Genset running without load for a settable time for coolant operation of the engine until stop.

If the emergency mode is selected, the genset is in stand -by, ready to automatically start to run in case of a mains failure.
When the mains is restored, the control panel manages the back-synchronization avoiding the second voltage lack.

(*) The operation sequence of the genset (if in island mode or in mains parallel) can be easily selected by means the menu of the controller and using a proper selector switch.

Measures

Mains Voltages:
L1-L2, L2-L3, L3-L1 True RMS measure.
Lx-N max. voltage < 300Vac cat. IV
Generator Voltages:
L1-L2, L2-L3, L3-L1, True RMS measure.
Lx-N max. voltage < 300Vac cat. IV
Generator Currents:
L1, L2, L3, N True RMS measure.
Nominal max. current: /5A.
Overload measurable current: 4x5Aac (sinusoidal, max.3s)
(*) Neutral generator current as alternative to ground fault protection or to be used for measure mains power.
Battery Voltmeter:
Resolution = 0.1V
Oil Pressure Gauge:
VDO 0-10 Bar, VDO 0-5 Bar, Veglia 0-8 Bar or Settable curve based on sensors available
Coolant Temperature sensors:
VDO, Veglia, BERU or Settable curve based on sensors available
Fuel Level:
VDO, Veglia, Generic max. 380 ohm or Settable curve based on sensors available
Engine revolution counter:
By W. Programmable frequency/revolution ratio.
Same Input can be used for pick-up signal.

Additional measures available by J1939 bus.
Linear Synchronoscope for synchronizing operations.

Computed Measures

- Active power
- Reactive power
- Apparent power
- Power factor: Total and phase by phase
- Active and reactive energy counter
- Hour counter
- Hour counter for maintenance/rental
- Start Counter

Engine Protections

- Overspeed (12)
- Coolant temperature by ON/OFF and by analogue (warning and block)
- Oil pressure by ON/OFF and by analogue (warning and block), Fuel level ON/OFF by ON/OFF and by analogue (warning and block)
- Belt break
- Maximum power
- Overcrank and start failure

Generator Protections

- Underfrequency (81U)
- Overfrequency (81O)
- Undervoltage (27)
- Overvoltage (59)
- Power direction (32)
- Loss of excitation (Reverse reactive 32RQ)
- Time dependent overcurrent (51)
- Instantaneous overcurrent (50)
- Synchro-check (25)
- Phase sequence (47)
- Current and Voltage unbalance (46/47)
- Ground Fault Protection (51N) (alternative to Neutral current measurement)
- Phase overcurrent with voltage restraint/control (51V)

Mains Protections

For Mains parallel applications, there are the following protections:

- Rate of Change of Frequency (81R ROCOF)
- Vector shift
- Mains voltage Max./Min. (27/59)
- Mains frequency Max./Min (81U/81O)

Composition

- N.1 Microprocessor genset controller GC500^{Plus} comprising synchronizer and automatic load sharing (additional details in the relevant datasheet);
- N.1 Selector switch for Load demand: OFF–ON;
- N.1 Selector switch for plant activation:
  LOCAL – 0 – REMOTE for island mode plants;
  LOCAL – EMERGENCY – REMOTE for Mains parallel;
- N.1 Emergency stop push button;
- N.1 Automatic battery charger 12Vdc or 24Vdc;
- N.1 Feeder for pre-heating water engine (both 230V and 400V);
- Power circuit (if required) equipped with N.1 Automatic and motorized circuit breaker 4 poles, N.3 Current transformers and copper bus bar properly sized;
- Series of additional materials (relays, fuses, terminal boards, ...);
- N.2 Programmable dry contacts at terminal board.

A series of additional circuits are available on demand:

- Series of feeders for aux circuits (i.e. electric radiators and fans, pumps, ant-condensate space heater, ...)
- Electronic devices for additional analogues I/O for temperature measures by PT100,Thermocouples, and Voltage / Current signals.

General functions

Real time clock calendar:
Hour, minute, second, day, month, year (leap year), day of week.
Genset operation can be enabled based on days of the week and time.
Test operation can be enabled based on days of the week.
Date and time can be remotely adjusted by software.
Rechargeable Lithium battery available as standard
Fast and Slow trend history log:
99 record
Event history log:
99 record
Fuel pump:
Board manages a fuel pump by means an external power relays and by 5 Input level signals. Auto and Manual operating mode.
Maintenance warning:
Board issue a warning when the running hours before maintenance are elapsed.
Panel Temperature warning:
Board issues a warning when panel temperature is approaching a specified temperature
Genset lock function:
Genset operation can be remotely disabled. Unlocking requires the supplied password.
Internal Alarm Horn:
Internal Alarm Horn makes easier panel assembling.

Communication

- N.1 Serial port RS232 with MODBUS RTU protocol
- N.1 Serial port RS232 or RS485 with MODBUS RTU protocol
- Direct GSM and PSTN Modem management
- Automatic call in case of event
- SICES Supervisor for the remote control of the genset already included for free.

AS OPTION:

- Serial converter RS232/485/USB available
- Communication via SMS with additional GSM modem
- Remote supervision with GPRS with additional module REWIND
- Ethernet interface module with TCP/RTU protocol
- Plug-in for SCADA (personalized software) interface

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