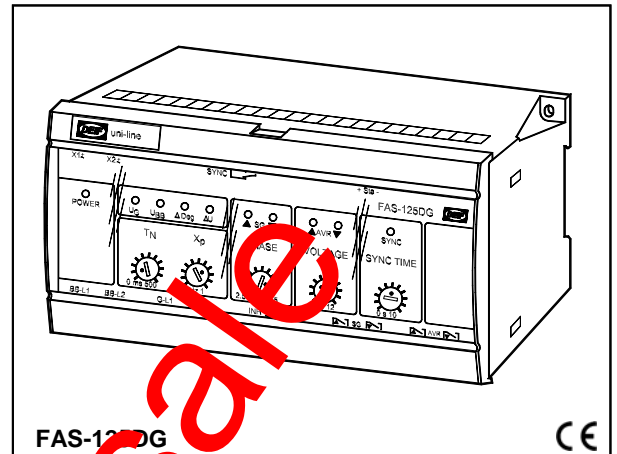


ANSI code 25
Type FAS-125DG

REPLACEMENT

Synchronisers
uni-line
4921240141D

- **Synchronisation of generator to busbar**
- **Automatic, static synchronisation**
- **With voltage matching**
- **LED indication of status**
- **LED for synchronising signal**
- **35 mm DIN rail or base mounting**



Application

The static synchroniser type FAS-125DG forms part of a complete DEIF series of relays for protection and control of generators and is applicable to both marine and land-based installations.

The FAS-125DG synchroniser with voltage matching compares the frequency and voltage of the generator with the busbar frequency and voltage, and controls the generator frequency and voltage - if necessary - till they match the busbar values.

It can be applied in conjunction with a wide range of prime movers, as its control pulses may be set to fit several types - from slowly reacting diesel engines to swiftly reacting gas turbines.

A static synchronisation is achieved by regulating the voltage and frequency of the generator plus the phase angle of the voltages of the generator.

The FAS-125DG is especially applicable to installations with no circuit breakers (e.g. where the generators/the mains are connected by mounting the relevant fuse).

In such applications the FAS-125DG will keep the phase angle difference between the generator and busbar voltage constantly at less than $\pm 10^\circ$ el. The phase angle difference is set on the potentiometer marked "PHASE".

Measuring principle

The synchroniser measures the busbar and generator voltages and frequencies and compare these, plus compares their phase angles.

If the voltage difference exceeds the span set on the potentiometer marked "VOLTAGE", the synchroniser will control the generator voltage, until the difference is within the set limits.

The generator frequency is regulated by the FAS-125DG, until it matches the busbar frequency $\pm 0.04\text{Hz}$.

The synchroniser then checks the phase angle of the generator voltage and if necessary regulates this, until it is within the "phase angle window" set on the potentiometer marked "PHASE".

The FAS-125DG will continue keeping the generator frequency within this range of $\pm 0.04\text{Hz}$.

When the phase angle has remained within the range set on the potentiometer marked "PHASE" for the period of time set on the potentiometer marked "SYNC TIME", the relay "SYNC" will be activated and the LED "SYNC" will be lit.

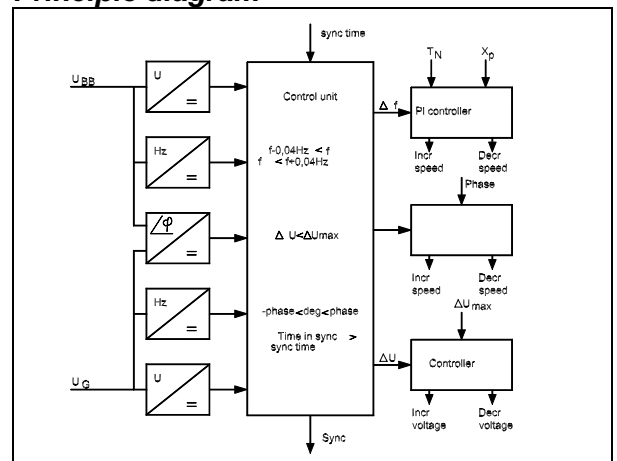
Should a phase angle shift occur at any time after this matching of the phase angles, or should the generator frequency exceed its tolerances, the FAS-125DG will reactivate its control of the frequency/phase angle.

T_N Pulse length
min. duration of the control pulse (ON time).

X_P Proportional band
Within which the pulse ratio changes proportionally to the frequency deviation from the busbar frequency.

Furthermore the relay is equipped with a self-check function. This function supervises the micro-processor and will switch the status output (17-18) to position OFF and start flashing with the power led, should the function detects a fault.

Principle diagram



Type FAS-125DG

Technical specifications

Meas. voltage: (See supply voltage - AC ranges)
load: 2k Ω /V.

Frequency range: 40...45...65...70Hz.

Inhibit input: Potential-free relay contact.
Open: 5V. Closed: 5mA.

Contact outputs:

synch. pulse output: 1 change-over switch

freq. control outputs: 2 make contacts

volt. control outputs: 2 make contacts

contact ratings: 250V-8A-2000VA (AC).
24V-8A-200W (DC).
(200 x 10³ change-overs at resistive load)

contact voltage: Max. 250V (AC). Max. 150V (DC).

Optocoupler output: System status off = failure.

Temperature: -25...70°C (operating).

Temperature drift: Set points:
max. $\pm 0.2\%$ of full scale per 10°C.

Galvanic separation: Between inputs and outputs:
3250V - 50Hz - 1 min.

Supply voltage (U_n): 57.7-63.5-100-110-127-200-220-230-
240-380-400-415-440-450-660-690VAC
 $\pm 20\%$ (max. 3.5VA)

24-48-110-220V DC -25/+30%
(max. 2W).

Climate: HSE, to DIN 40040.

EMC: To EN 50081-1/2, EN 50082-1/2,
SS4361503 (PL4) and IEC 2553.

Connections: Max. 4 mm² (single-stranded).
Max. 2.5 mm² (multi-stranded).

Materials: All plastic parts are self-extinguishing to
UL94 (V1).

Protection: Case: IP4. Terminals: IP20,
to IEC 529 and EN 60529.

Type approval: The unit line components are approved
by the major classification societies. For
current approvals see www.deif.com or
contact DEIF A/S.

Settings

Setting of	Range
T _N Control pulse length	25...500 ms
X _P Proportional band	$\pm 0.25... \pm 1$ Hz
PHASE Acceptable phase diff.	2.5...22.5°el.
ΔU_{\max} Acceptable volt. diff.	$\pm 2... \pm 12\%$ of U _{BB}
SYNC Synchronisation time	0.5...10 s

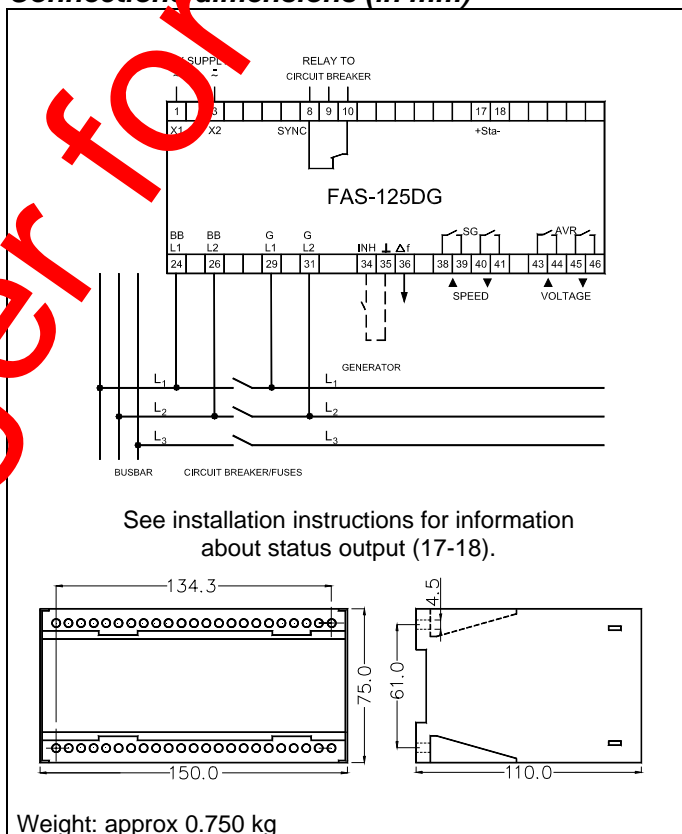
Indication

LED's	Light
U _G Generator voltage	Green, when value is within the acceptable range. Switched off, if outside this range.
U _{BB} Busbar voltage	
Δ Deg Phase difference	
Δ U Volt. difference	
Sync Synchronising	Yellow, when relay is activated.
SG Incr. speed (freq.)	
SG Decr. speed (freq.)	
AVR Increasing voltage	
AVR Decreasing voltage	

The relay is furthermore equipped with a green LED marked
"POWER" for indication of power ON.

Once the relay has been mounted and adjusted, the
transparent front cover may be sealed, preventing unwanted
change of the setting.

Connections dimensions (in mm)



Order specifications

Type - Measuring voltage - Supply voltage
Example: FAS-125DG - 380V AC - 24V DC

Due to our continuous development we reserve the right to
supply equipment which may vary from the described.



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