

Version S.C.L.
Synchronous drives

*without
feedback*

Version A.S.C.L.
Asynchronous drives

*without
feedback*



COMBIVERT **F5**

...encoderless controlled drives



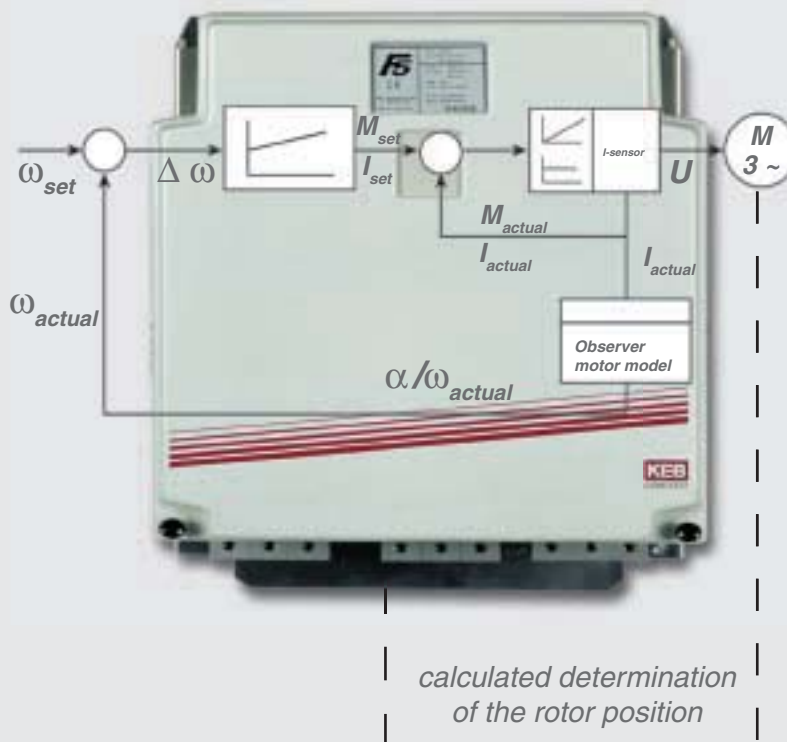
High End Open Loop ...

High speed stability and accuracy, together with reproducible torque, form the basis for process control, on which high-quality products are developed.

From our many years experience of advanced servo systems, KEB had developed advanced drive control algorithms to build a virtual rotor position within the control software; this is achieved **without feedback of the motor shaft**.

KEB developed solutions for both synchronous and asynchronous motors, for tasks requiring high speed and torque control.

The principle - genuine field operation without feedback



The advantages for the application are...

- accurate speed and torque characteristics
- reduced costs due to omission of encoder, interface and cable
- robust system solution with increased operational reliability, since potential sources of interference from the encoder system are removed
- determined data directly transferable to similar drive systems

- without feedback

F5-S.C.L. for Synchronous Motor Technology

has been designed for high performance speed and torque control in processes, where the system-related advantages of permanent magnet motors can be gained without feedback.

- optimal degree of efficiency, high energy effectiveness
- wide speed range with slip-free control
- low rotor inertia and low thermal load
- reduced construction volume, smaller overall sizes with high power density
- high protection category, robust design



F5-A.S.C.L. for Asynchronous Motor Technology

uses standard drives with a wide power range, for applications with demanding requirements for consistent speed and torque accuracy.

In both versions the current controller provides a load-dependent current supply with:

- excellent overload capacity
- without additional losses in idle-run mode
- fast correction of load peaks
- precise torque control



Sensorless Closed Loop for Syn

Conventional solution



F5-S.C.L.



with feedback

- ➔ installation space for encoder
- ➔ encoder cable
- ➔ encoder interface in the inverter

without feedback

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-
-

Characteristics with **F5-S.C.L.**

- improved speed stability in relation to “vector control” units
- identical performance during sudden load variation compared to closed loop drives
- torque accuracy typical $< 3\% T_N$
- **display values** with
 - ➔ correction alignment in the system “on the fly”
- *standstill position detection (calibration without rotation)*
- *operation with output filters*

Dynamic correction performance of a load



asynchronous Motors

F5-S.C.L.

available power range 0.37 kW ... 900 kW
in the voltage classes

1/3ph. 230 V; 3ph. 400 V, 3ph. 690 V

Order code: F5-E



Characteristics

- *low installation costs due to the omission of*
 - the encoder cable
 - the encoder
 - the encoder interface
- *high dynamics*
- *slip-free motion*
- *less space required*
- *low weight*
- *high efficiency*
- *high availability*



Applications

- *powered tools in machining centres*
- *synchronous processing in textile machines*
- *hybrid drives*
 - *diesel electric traction drives in conveyor systems*
 - *electric drives in boats, yachts and vehicles*
- *high frequency pump drives in compressors, chargers, screws, vacuum pumps*
- *synchronous extruder*
- *injection moulding technology*
- *blow moulding technology*



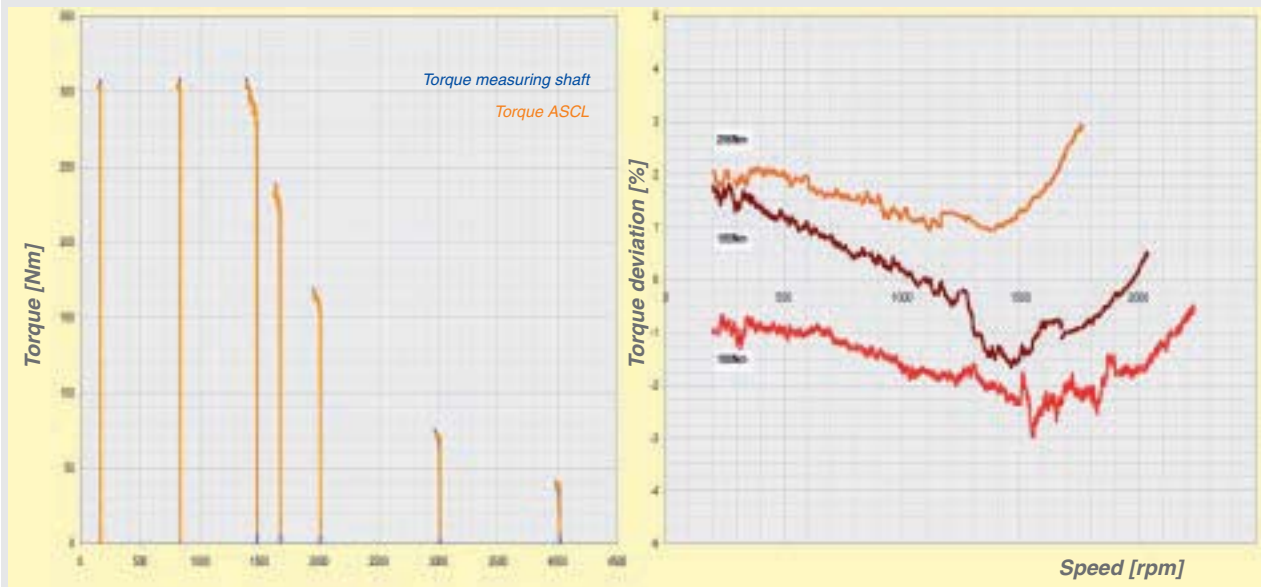
Asynchronous - Sensorless - Closed Loop

Universal, asynchronous drives for high end tasks with the following characteristics:

FS-A.S.C.L.

- **Automatic motor data**
 - ➔ automatic measurement and modelling, of *motor characteristics* combine to give excellent control.
 - ➔ *motor model includes thermal computation.*
- **Controller Integration ➔ Symmetrical Optimum (SO)**
 - ➔ *only 1 parameter for the optimisation of the drive K_i / K_p*
 - ➔ *simplifies the K_i/K_p alignment of the automatic speed control loop*
 - ➔ *speed regulator pilot control*
- **Accurate torque indication** through, amongst other things
 - ➔ *the determination of torque offsets.*
 - ➔ *adjustment of the system's idle run torque (optional)*

FS-A.S.C.L. Torque characteristics



Torque accuracy typical < 3 % T_N

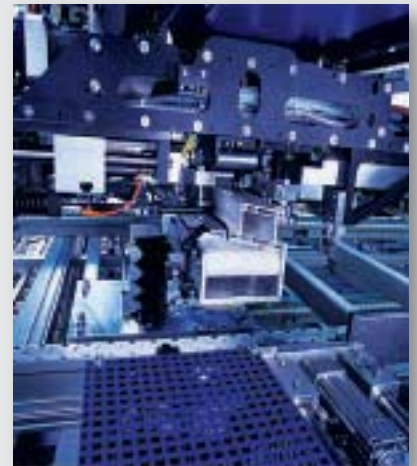
osed Loop

F5 - A.S.C.L.

available power range 0.37 kW ... 900 kW
 in the voltage classes
 1/3ph. 230 V; 3ph. 400 V, 3ph. 690 V
 Order code: F5-H

Applications

- *Extruder main drives*
- *Crusher drives / Shredder*
- *Centrifuges*
- *Test stands / test systems*
- *Agitators and mixers*
- *Cutter and passing machines*
- *Processing machines for wood, plastic, metal, ...*
- *Mixers*
- *Heat pumps*
- ...



people in motion



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