

Siltron 1980



Silco 1985



DC-300 1985



DC-2000 1990

TMdrive[®]-DC DFE Product Guide

DC System Drive Modernization

metals

cranes

paper

cement

oil & gas

mining

utilities

rubber &
plastics

Modernizing Your Legacy DC Drives

Extend the Life of Legacy DC Drives, and get the Latest in High Performance Digital Control and High-Speed Communications



TMdrive-DC DFE installed on Silpac 3100 Drive

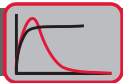
Drive modernization is a simple procedure as follows:

1. Leaving the original motor, wiring and power connections in place, the control and I/O boards, and control wiring are removed
2. The new TMEIC Digital Front End (DFE) module, complete with control boards and hinged mounting plate, is mounted on the front of the drive as shown here (or can be panel mounted)
3. The keypad is mounted either on the drive or on the drive cabinet door
4. The DFE is wired to the drive and the I/O wiring is connected to the new I/O board

DFEs are Available for these DC Drives

| | | | |
|--------------|-----------------|----------------|---------------------|
| Silcon Six | Digital Siltron | Silpac 6160 | SilcoMatic |
| Silpac 600 | Silco Plus | Valutrol | Silpac 3000 |
| *DC-2000 | *DC-300 | Silpac 3100 | Silco-2000 (future) |
| Siltrol Plus | Silpac 3160 | Analog Siltrol | Silpac 3200 |

* On DC-300 and DC-2000 drives, the new boards are mounted in the same locations as the existing boards. There is no DFE module as shown above.



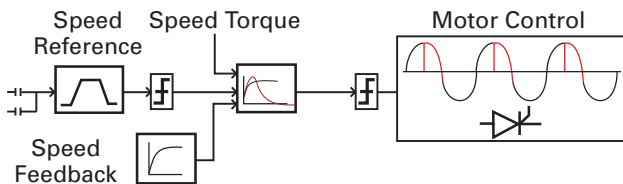
Control Functions

Feedback and Status

I/O Mapping

Capture Buffer

Sequencing



Motor Control

Speed Regulator With (Resolver or Encoder)

| | |
|---|-------------|
| Speed Control Range | 1-100% |
| Speed Control Accuracy (Rated Speed: 100%) | +/- 0.01% |
| Field Weakening Range (Base Speed: Top Speed) | 1:5 |
| Maximum Speed Response | 30 rad/sec |
| Maximum Current Response | 300 rad/sec |
| Armature Current Control Accuracy | +/- 0.5% |

Voltage Regulator

| | |
|---|---|
| Speed Control Range | 1-100% |
| Speed Control Accuracy (Rated Speed: 100%) | +/- 1% with digital ref +/- 1% with analog ref |
| Field Weakening Range (Base Speed: Top Speed) | 1:5 |



I/O Interface

Digital Inputs

+24 V dc



- Opto-coupled 20 mA
- Quantity 6 configurable mapping

24-110 V dc
48-120 V ac



- Opto-coupled 10 mA
- Quantity 1 configurable mapping
- Quantity 1 dedicated mapping

Digital Outputs

+24 V dc



- Open collector 70 mA
- Quantity 6 user defined

Analog Inputs

10 V, 4-20 mA



- Quantity 2 ±10 V or 4-20 mA
- Differential 8 Ω input impedance
- 12-bit resolution
- Optional Quantity 2 ±10 V
- 12-bit resolution

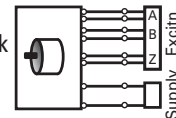
Analog Outputs

10 V



- Quantity 3 ±10 V, 10 mA max
- User defined
- 8-bit resolution

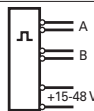
Speed Feedback Encoder Input



- A quad B with marker
- Maximum frequency of 100 kHz
- Differential 5 or 15 V dc
- 5 or 15 V dc at 200 mA supply

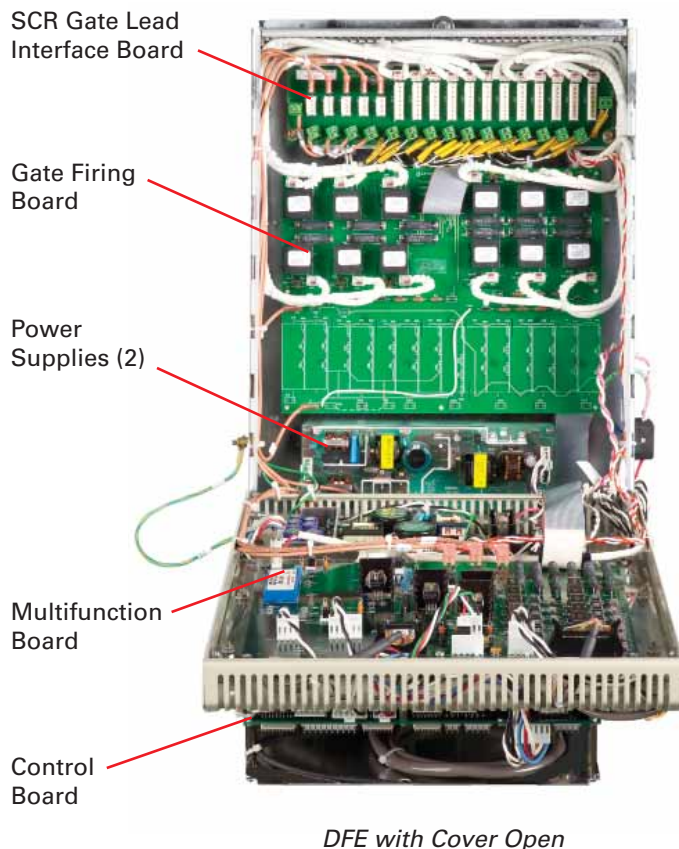
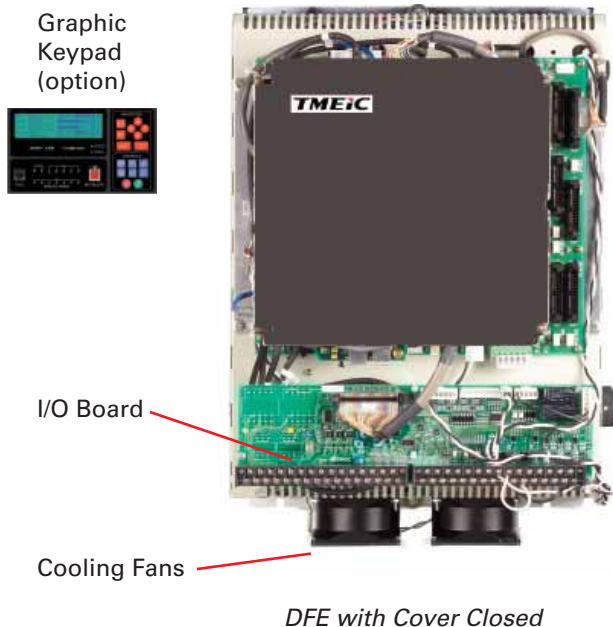
Speed Tach

Follower Output



- Maximum frequency of 10 kHz
- External 15-48 V dc at 100 mA max

A Closer Look at the DFE Module Assembly



Instrumentation Interface

Standard Display



- The digital display alternates between speed, current, and fault code in the event of an error
- RJ-45 Ethernet port for local/remote toolbox connection
- Ready, Run, and Alarm/Fault LEDs
- Interlock button disables drive

Optional Graphic Keypad



- Four configurable variable bar graphs with descriptive legends
- Status icons reflecting health of drive at a glance
- Dedicated drive control keys for manual operation of the drive
- Full access to all parameters and variables

Configuration



- RJ-45 Ethernet interface
- 10 Mbps maximum
- Drive Navigator option of TOSLINE-S20 to Ethernet connection using V-Series controller as gateway
- Toolbox option of ISBus to Ethernet using Innovation Series® controller as gateway

Meter Outputs



- Armature and field current, ± 10 V
- Quantity 5 configurable, ± 10 V, 8-bit resolution



LAN Interface Options



| LAN | # Nodes | bps | Protocol |
|-------------|---------|-----------|-----------------|
| ISBus | 32 | 5 M | Master/Follower |
| Profibus-DP | 126 | 9.6k-12M | Master/Follower |
| DeviceNet | 64 | 125k-500k | Master/Follower |
| TOSLINE-S20 | 64 | 2M | Peer-to-Peer |



Environmental

| | |
|-----------------------|---|
| Operating Temperature | 0 to 40°C (32 to 104°F) at rated load at converter inlet -20 to 50°C (-4 to 122°F) with derating |
| Storage Temp. | -25 to 55°C (-13 to 131°F) |
| Humidity | 5 to 95% relative humidity, non-condensing |
| Altitude | 0 to 3500 m (11480 ft.) above sea level Derate 2% per 200 m above 1000 m altitude |



Mechanical

| | |
|-------------|-------------------|
| Enclosure | IP20 (NEMA 1) |
| Wire Colors | Per CSA/UL and CE |

Global Supplier of Drives and Automation Systems



Metals Systems

The metals systems integration team supplies drive and automation systems for metal rolling and metal strip processing applications.



Material Handling Systems

The material handling integration team supplies automation systems for dock-side quay and rubber tire gantry (RTG) cranes.



Paper Systems

The paper systems integration team supplies coordinated drive systems for paper machines, off-machine coaters, and super calendars.



Engineered Drives Systems

The engineered drives team supplies drive/motor systems to the mining industry and other general industry applications.

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