DECS-300 Digital Excitation Control System

The DECS-300 Digital Excitation Control System is a microprocessor-based device intended for generator power management. This device provides control signals for phase control of SCR bridges manufactured by Basler Electric. The DECS-300 provides precision control for generators of any size and is equally suited for exciter field or main field applications.

FEATURES

- Microprocessor-based design
- True RMS voltage sensing, single or three phase
- Control outputs: 4-20mA, 0-10Vdc or ±10Vdc analog output
- 0.25% Voltage Regulation Accuracy
- Setup from front panel HMI or by PC with free Windows® setup software
- 40 standard stability selections
- User customizable stability selection with two PID setting groups
- Paralleling compensation
- Line drop compensation
- Underfrequency compensation or V/Hz Ratio Limiter
- Voltage Soft-Start buildup
- Field Current Regulation Mode (Manual Mode)
- Autotracking between operating modes and between DECS-300 units
- Autotransfer to a back-up DECS-300 unit
- Remote set point control via:
  - Contact inputs
  - Proportional control via ±10Vdc or 4-20mA
  - Communications inputs RS-232 (ASCII) or RS-485 (Modbus™)
- Minimum Excitation Limiter (Internally generated or customizable)
- On and off-line Maximum Excitation Limiters
- Stator Current Limiter
- VAR and Power Factor Controller
- Sequence of Events Recording
- Oscillography   (continued on next page)

WINDOWS® SOFTWARE

Interface for setting and communicating with Basler products
    Request BESTCOMS-DECS300-32
    (Microsoft Windows® NT 3.51 or later, 95, 98, Me or XP)

ADDITIONAL INFORMATION

INSTRUCTION MANUAL
    Request Publication 9310300990

Basler Electric

SZE-5
9-02

FEATURES, continued

- Voltage Matching
- Seven generator protection features
- Programmable output contacts
- Front panel backlit LCD display
- Front panel mounted RS-232 and rear-mounted RS-485 communications ports

- Modbus™ protocol for RS-485 input allows communications up to 4000 feet away
- <1% metering accuracy for 13 generator parameters
- Meets C37.90.1-1989 for Surge Withstand and Fast Transient
- UL recognized, CSA certified, CE compliant
- U.S. Patent Number 5,294,879

DESCRIPTION

The DECS-300 is a microprocessor based excitation controller. It provides output control signals to control the firing (output) of an external power bridge. The DECS-300 is designed to work with Basler Electric's SSE and SSEN power bridges, but will work equally well with any power bridge suitable for use on a synchronous generator/motor that has a firing circuit capable of accepting the control signal output from the DECS-300. The DECS-300 is a total excitation control system in one 19 inch rack mount enclosure. It contains all the functionality necessary to limit, control and protect a generator from operating outside of the machine's capability. DECS-300's sophisticated design allows the nonactive control mode within the unit to track the active mode, permitting bumpless transfer between modes. The software also allows for unit-to-unit communication, permitting autotracking and transfer between DECS-300 units. It can also communicate to a PC via the front panel RS-232 port for local programming and metering, and it can communicate via Modbus™ protocol via the rear-mounted RS-485 port for communications up to 4000 feet away from the DECS-300 unit. The DECS-300 has all the features, functionality, flexibility and program-mability expected from a state-of-the-art microprocessor based product.

APPLICATIONS

The DECS-300 is an excitation control system used to control the output voltage, VARs or Power Factor of a synchronous generator by varying or controlling the amount of dc excitation applied to either the generator's main field or exciter field. The DECS-300 is suitable for virtually any kW size machine.

SPECIFICATIONS

INPUTS

Power Input
    DECS-300-L: 24/48Vdc nominal (16-60Vdc), Burden=30W.

    DECS-300-C: 120Vac nominal (85 to 132Vac, 50 or 60Hz), Burden=50VA.
                           125Vdc nominal (90 to 150Vdc), Burden=30W.

Generator Voltage Sensing   Single-phase or three-phase line voltage, two ranges:
                                        • 100V/50Hz nominal (85 to 127V), 120V/60Hz nominal (94 to 153V)
                                        • 200V/50Hz nominal (170 to 254V), 240V/60Hz nominal (187 to 305V)

Bus Voltage Sensing   Single-phase line voltage (AC), two ranges:
                                        • 100V/50Hz nominal (85 to 127V), 120V/60Hz nominal (94 to 153V)
                                        • 200V/50Hz nominal (170 to 254V), 240V/60Hz nominal (187 to 305V)

Generator Current Sensing   Two ac current sensing ranges and two channel (phase) inputs
                                        • 1A, phase B; 1A, phases A or C
                                        • 5A, phase B; 5A, phases A or C

Sensing Burden   Voltage: Less than 1VA per phase.
                                        Current: Less than 1VA.
                                        Parallel Compensation: Less than 1VA.

SPECIFICATIONS, continued

Contact Switching Inputs
Thirteen contact switching inputs are supplied with 24Vdc to accommodate dry contacts. Contacts are as follows:

- Start
- Stop
- Alarm Reset
- Unit/Parallel Operation
- Dual PID selection
- VAR/PF Enable
- Pre-position 1
- Pre-position 2
- Secondary DECS Enable
- FCR Mode
- AVR Mode
- Raise Switch
- Lower Switch

Remote Set Point Control
(Accessory Input)
Analog input for remote set point control. Typically used to accept a signal from a Power System Stabilizer. Select one of two configurations.

- ±10Vdc
- 4 to 20 milliamperes, dc

OUTPUTS
Control Outputs
Analog output for set point control. Output drives external Firing Circuit/Rectifier Bridge. Select one of three configurations.

- ±10Vdc
- 0 to +10Vdc
- 4 to 20 milliamperes, dc

Contact Outputs

Make and carry for tripping duty
30 amperes for 0.2 seconds per ANSI C37.90; continuous for 7 amperes

Break resistive or inductive
0.3 amperes at 125 or 250Vdc (L/R=0.04 maximum).

Eight output contacts rated as described with 300 volt surge suppressors installed across contacts to prevent arcing from inductive loads. Contacts are as follows:

Preset:
- Buildup
- Fail-to-flash
- Watchdog
- Start/Stop

Programmable:
- Relay #4
- Relay #3
- Relay #2
- Relay #1

ISOLATION MODULE
(Isolation module and case are included with DECS-300)
Operating voltage + and - 12Vdc from DECS-300.
Five field voltage sensing ranges: 32, 63, 125, 250 and 375 volts
Field analog output signal: 0.9 to 9.1Vdc   (5.0Vdc=0 field voltage)

Two field current sensing ranges: 50 and 100 millivolts.
Field analog output signal: 2.0 to 9.5Vdc (2.0Vdc=0 field current)

COMMUNICATION
There are three communication ports, two RS-232 and one RS-485.
COM0: RS-232, 9 pin, sub-D connector located on front panel and used to communicate with local computers. 1200 to 19200 baud, 8N1 full duplex, ASCII commands
COM1: RS-232, 9 pin, sub-D connector located on rear panel and used to connect primary and backup DECS-300 units or other devices. 1200 to 19200 baud, 8N1 full duplex, unique ASCII commands, only used for autotracking
COM2: RS-485, located on rear panel and used to communicate with local or remote computers or other devices. 1200 to 19200 baud, 8N1 half duplex, Modbus™ protocol

REGULATION ACCURACY
AVR Mode
Voltage regulation equals ±0.25% over the load range at rated power factor and constant generator frequency. Steady state stability equals ±0.1% at a constant load and generator frequency. Temperature drift equals ±0.5% for 0 to 50°C

SPECIFICATIONS, continued

REGULATION ACCURACY, continued	temperature change. Underfrequency (volts/hertz) characteristic slope from 0 to 3.0 P.U. is adjustable in 0.1 P.U. increments. Voltage regulation error is within ±2.0% of the nominal voltage.
FCR Mode	Field current regulation equals ±1.0% of the nominal value for 10% of the bridge input voltage change or 20% of the field resistance change. Otherwise, ±5.0%.
VAR Mode	±2.0% of the nominal VA rating at the rated frequency.
PF Mode	±0.02 PF in the set point PF for the real power between 10 and 100% at the rated frequency. (e.g. set point PF = 0.80, PF regulation is from 0.78 to 0.82 PF.)
Autotracking	±0.5% of the setting change when transferring.
PARALLEL COMPENSATION	Can use either reactive droop or reactive differential (cross-current) compensation. Droop adjustable from 0% to +30% in 0.1% increments. Parallel compensation burden is less than 1VA.
LINE DROP COMPENSATION	Active when the droop setting is set as a negative value. Adjustable from -30% to 0% in 0.1% increments.
FIELD OVERVOLTAGE PROTECTION	Adjustable in increments of 1.0Vdc from 1.0 to 900Vdc rated output voltage with a 0.2 to 30 second inverse time delay settable in increments of 0.1 second.
FIELD OVERCURRENT PROTECTION	Adjustable in increments of 0.1% steps of rated field current from 0 to 9999Adc excitation current setting with an inverse time delay (ANSI C50.13).
FIELD OVERTEMPERATURE PROTECTION	Adjustable from 0 to 300°C or 572°F in 0.1 steps. The parameters needed for the DECS-300 to calculate field temperature are: field ambient temperature, brush voltage drop, and field resistance. This feature is intended for generator main field applications and not for rotary exciter applications.
GENERATOR UNDERVOLTAGE PROTECTION	Adjustable in increments of 1Vac from 0 to 30kV sensing voltage setting with a 0.5 to 60 second definite time delay settable in increments of 0.1 second.
GENERATOR OVERVOLTAGE PROTECTION	Adjustable in increments of 1Vac from 0 to 30kV sensing voltage with a 0.1 to 60 second inverse time delay (ANSI C50.13) settable in increments of 0.1 second.
GENERATOR LOSS OF FIELD PROTECTION	Adjustable in increments of 1 kvar from 0 to 3,000 Mvar with a 0.1 to 9.9 second delay settable in increments of 0.1 second.
LOSS OF VOLTAGE SENSING	The loss of voltage sensing can be set for a balanced level of 0-100% and unbalanced level of 0-100%. The time delay is adjustable for 0-30 seconds in 0.1 second increments.
VOLTAGE SOFT-START	Functional in AVR and FCR with an adjustable rate of 1 to 200 volts per second in AVR, and 1 to 33% of the manual set point per second.
SUMMING POINT TYPE OEL On-Line	Limiter response time is less than three cycles. *Level One* – Highest current level (instantaneous) set point adjustable from 0 to 9999Adc in 0.1% increments of the rated field current. Limiting occurs for a time period ranging from 0 to 60 seconds, settable in 1 second increments. *Level Two* – Medium current level set point adjustable from 0 to 9999Adc in 0.1% increments of the rated field current. Limiting occurs for a time period ranging from 0 to 120 seconds, settable in 1 second increments. *Level Three* – Lowest current level set point adjustable from 0 to 9999Adc in 0.1% increments of the rated field current. Limiting occurs indefinitely.

SPECIFICATIONS, continued

Off-Line	*Level One* – Highest current level set point adjustable from 0 to 9999Adc in 0.1% increments of the rated field current. Limiting occurs for a time period ranging from 0 to 60 seconds, settable in 1 second increments. *Level Two* – Lowest current level set point adjustable from 0 to 9999Adc in 0.1% increments of the rated field current. Limiting occurs indefinitely.
TAKEOVER TYPE OEL	The Takeover OEL uses an I^2t characteristic. Limiter response time is less than three cycles.
On-Line	*High Level* – High current level (instantaneous) set point is adjustable from 0 to 9,999 Adc in 0.1 Adc increments. *Low Level* – Low current set point is adjustable from 0 to 9,999 Adc in 0.1 Adc increments. Limiting occurs indefinitely. *Time Dial* – This setting determines the inverse time curve selected.
Off-Line	*High Level* – High current level (instantaneous) set point is adjustable from 0 to 9,999 Adc in 0.1 Adc increments. *Low Level* – Low current set point is adjustable from 0 to 9,999 Adc in 0.1 Adc increments. Limiting occurs indefinitely. *Time Dial* – This setting determines the inverse time curve selected.
UNDEREXCITATION LIMIT	Adjustments based on generator ratings.
STATOR CURRENT LIMITING	*High Level* – Highest current level set point adjustable from 0 to 60,000 Aac in 0.1 Aac increments. Limiting occurs for a time period ranging from 0 to 60 sec., settable in 0.1 sec. increments *Low Level* – Lowest current level set point adjustable from 0 to 60,000 Aac in 0.1 Aac increments. Limiting occurs indefinitely.
SEQUENCE OF EVENTS RECORDING (SER)	127 event reports stored in volatile memory (retrievable via BESTCOMS). SER triggered by: Input/Output status changes, system operating status changes, and alarm annunciations.
OSCILLOGRAPHY	Stores 8 records. Up to 6 variables can be logged in a record. Sampling rate: 600 data points per log, pre-trigger adjustable from 0 to 599 data points, 4 rms to 10 sec intervals between data points (2.4 sec to 6000 sec. total log duration)
MANUAL EXCITATION CONTROL	Regulates field current from 0 to 5000A in increments of 0.1% of the rated output current
VOLTAGE MATCHING	Matches utility bus RMS voltage with generator output RMS voltage within ±0.15% of the generator voltage
RFI (Radio Frequency Interference)	Meets IEC 60255-22-6 (RF Conducted) and IEC 60255-22-3 (Radiated Electro-magnetic Field)
FAST TRANSIENT	Meets IEC 60255-22-4
EMISSIONS	Meets CISPR11/EN55011 Level A
ENVIRONMENTAL	
Temperature	Operating: -40°C to +60°C; Storage: -40°C to +85°C
Shock	15 Gs in each of three mutually perpendicular planes
Vibration	2Gs at 10 to 500Hz
Size	19 inch rack mount, 3 rack units high
Weight	13.5 lb. (6.12kg) net, 17 lb. (7.71kg) shipping

FEATURES/FUNCTIONS

Voltage Regulation
The DECS-300 regulates the generator RMS voltage to within 0.25% from no-load to full-load. It does this by utilizing digital signal processing and precise regulation algorithms developed by Basler Electric, utilizing the experience gained in many years of manufacturing tens of thousands of digital voltage regulators.

Output Signals
The DECS-300 sends a non-isolated output signal of 4-20 mA, 0-10 Vdc, or ±10Vdc to the firing or control circuits of external power stages. The dc current from the power stages provides ex-citation to the field of the main generator or exciter. DECS-300 can control virtually any bridge, capable of accepting these signals, that is suitable for use on synchronous generators/motors.

Stability
The DECS-300 utilizes proportional (P), integral (I) and derivative (D) stability control. DECS-300 has 40 preprogrammed stability (PID) settings for both main field (20 settings) and exciter field (20 settings) applications. This means that a standard stability setting is already available for most applications/machines. The DECS-300 allows for customizing the stability settings to provide optimum customized generator transient performance. Setup software contains a PID selection program to assist in determining the correct PID settings. The DECS-300 provides for customizing the stability and transient performance of the Min/Max Excitation Limiter and VAR/PF controllers by providing additional stability adjustments.

Two PID Setting Groups
The DECS-300 provides for two sets of PID settings to optimize performance under two distinct operating conditions, such as with a Power System Stabilizer in or out of service. A fast controller provides optimum transient performance with the PSS in service, while a slower controller can provide improved damping of first swing oscillations with the PSS off line.

Underfrequency Limiter
or V/Hz Ratio Limiter
DECS-300 is selectable for either Underfrequency Limiter or a V/Hz Ratio Limiter function. The under-frequency limiter slope can be tuned to have 0-3 p.u. Volts/Hz, in 0.1Hz increments, and the frequency roll-off kneepoint can be set across a range of 45 to 65Hz, in 0.1Hz increments. This adjustability allows the DECS-300 to precisely match the operating characteristics of the prime mover and the loads being applied to the generator. The V/Hz Ratio Limiter clamps the regulation set point to prevent operation above a V/Hz level prescribed by the slope and roll-off settings as stated above. This feature is also useful for other potentially damaging system conditions such as a change in system voltage and reduced frequency situations that exceed the V/Hz ratio.

Soft-Start Voltage Buildup
Generator voltage overshoot can be harmful to the generator's insulation system if not controlled. DECS-300 has a soft-start feature with a user-adjustable setting to govern the rate at which the generator voltage is allowed to build up. This prevents the generator voltage from overshooting nominal voltage levels during start-up of the generator system.

Paralleling Compensation
DECS-300 has provisions to parallel two or more generators using reactive droop or reactive differential compensation with the addition of an external current transformer with secondary currents of 1 or 5Aac. The current input burden is less than 1VA. This low burden means that existing metering CTs can be used and dedicated CTs are not required.

Line Drop Compensation
Inputting a negative value for the droop setting provides a means to compensate for the reactive impedance losses of the step-up transformer, effectively moving the regulation point beyond the terminals of the machine.

Set Point Control
DECS-300 has means for external set point adjustment of the controlling mode of operation. This eliminates the need for additional equipment like motor operated potentiometers for remote control or multiple point control for the excitation system. The operating mode's set point may be directly controlled by raise/lower contact inputs, auxiliary inputs of 4-20 mA or ±10Vdc. The auxiliary input adjusts the operating mode across its predetermined adjustment range. The auxiliary input can be provided from other controlling devices such as a power system stabilizer. These devices modify the operation of the DECS-300 to meet specific operating characteristics and requirements for the machine under DECS-300 control. Two more methods of set point control may be achieved via the RS-232 communication port by using the Windows® based PC software or by the RS-485 port using Modbus™ protocol. Regardless of which method of set point is used (contact inputs, auxiliary input or communications with a PC or PLC), traverse rates of all modes of operation are independently adjustable. This means an operator can customize the rate of adjustment and "feel" to meet his/her needs.

Pre-position Inputs
DECS-300 provides the added flexibility of allowing a choice of two customer-adjustable sets of predetermined operating points for each mode of operation. With a contact input to the DECS-300, the operating mode is driven to an operating or regulation level assigned to that operation mode by the operator or user. The pre-position inputs operate in one of two modes, Maintain or Release. The Maintain mode prevents adjustment of the set point as long as the pre-position contact is closed. The release mode allows adjustment of the set point even though the pre-position is closed. This

FEATURES/FUNCTIONS, continued

feature allows the DECS-300 to be configured for specific system and application needs.

Field Current Regulation Operating Mode
DECS-300 provides a manual channel of operation called Field Current Regulation, or FCR, Mode. In this mode, DECS-300 regulates the DC output current of the power bridge. It does not rely on the sensing input to DECS-300 and is, therefore, a good source of backup excitation control when loss of sensing is detected. In this mode, control of the generator is totally dependent upon the operator to maintain nominal generator voltage as the load varies on the generator.

VAR/Power Factor Controller Operating Mode
DECS-300 has, as another standard feature, two modes of operation when the generator is in parallel with the utility power grid. The DECS-300 has both VAR and PF modes of operation. When the generator is in parallel with the utility grid, the DECS-300 can regulate the VAR output of the generator to a specific VAR level magnitude or it can vary the VAR output of the generator to maintain a specific power factor as the kW load varies on the generator.

Overexcitation Limiter
Overexcitation limiting (OEL) operates in all modes except FCR mode. OEL senses the field current output of the voltage regulator or static exciter and limits the field current to prevent field overheating. In FCR mode, the DECS-300 only announces that all conditions for OEL are fulfilled and does not provide limiting. The DECS-300 provides two types of overexcitation: Summing Point and Takeover.
Summing Point Type OEL
Three OEL current levels are defined for on-line operation. They are high, medium, and low. The generator can operate continuously at the low OEL current level and for programmed times at the high and medium OEL current levels. Two OEL current levels are defined for off-line (main breaker open) operation. They are high and low. The generator can operate continuously at the low OEL current level and for a programmed time at the high OEL current level.
Takeover Type OEL
With the Takeover-style overexcitation limiter, the field current level at which limiting occurs is determined by an inverse time characteristic. Two current levels and a time dial setting are defined for the takeover-style OEL limiter. Separate curves may be selected for on-line and off-line operation. If the system enters an overexcitation condition, the field current is limited and made to follow the selected curve. The selection of on-line or off-line OEL levels/curves is determined by an OEL option selection.

Minimum Excitation Limiter
The minimum excitation limiter limits the amount of excitation supplied to the field of the generator from dropping below unsafe operating levels. This prevents the machine from possibly slipping poles and from damaging the machine. It limits the amount of VARs being absorbed by the machine, based on user-definable settings.

An internally generated Underexcitation Limiting (UEL) curve can be utilized based on a VAR level at 0kW, or a customizable 5 point UEL curve can be selected to match specific generator characteristics.

Stator Current Limiter
The stator current limiter (SCL) senses the level of stator current and limits it to prevent stator overheating. The SCL operates in all modes except FCR. In FCR mode, the DECS-300 only announces that a stator overcurrent condition exists; it does not provide current limiting.
Two SCL current levels are provided: high and low. The generator can operate continuously at the low SCL level, but only for a programmed time at the high SCL level.

Autotracking Between DECS-300 Operating Modes
DECS-300 is an intelligent device that can provide autotracking (autofollowing) of the controlling mode by the non-controlling modes. This allows the operator to initiate a controlled, bumpless transfer of the DECS-300 operating modes, causing minimum amounts of line disturbance for the power system. This feature can be used in conjunction with a set of protective relays to initiate a transfer to a backup mode of operation, such as FCR mode, upon the detection of a system failure or fault, i.e., loss of sensing.

Autotracking between DECS-300 Units
A DECS-300 can also follow (autotrack) a second DECS-300 unit. The second DECS-300 is put into a specific operating mode and follows the excitation level of the first. In the unlikely event of a failure of the first DECS-300, protective relays can initiate a transfer of control from the first to the second DECS-300.

Protective Functions
There are several protection functions built into the DECS-300 unit. These functions may be used as backup to the primary protection relays and can be assigned to up to four programmable output contacts via the PC software. The protection features offer fully adjustable tripping levels and time delays. The protective features are as follows:
- Generator Overvoltage
- Field Overvoltage
- Field Overtemperature
- Generator Undervoltage
- Field Overcurrent
- Loss of Sensing
- Loss of Field
- Watchdog Timer

Sequence of Events Recording (SER)
A sequence of event report (SER) is a very powerful tool when reconstructing the exact timing of an event or disturbance. The DECS-300 monitors its contact inputs and outputs for a change of state, system operation changes, and alarm conditions. If any of these events occurs, the DECS-300 will log that event with a date and time stamp. Date and time stamping of the event allows the user to recreate a chain of events in the sequence in which they occurred. The DECS-300 can store 127 events in volatile memory, and those events are retrievable using BESTCOMS.

FEATURES/FUNCTIONS, continued

Oscillography

The data recording feature can record up to eight (8) oscillographic records stored in volatile memory. The user can select up to six (6) variables to be monitored when triggered by the DECS-300 BESTCOMS, a Logic Trigger, or a Level Trigger. Variables that can be selected are: generator voltage, current (single phase), frequency, kW, Power Factor, field voltage, and field current.

The user can utilize the DECS-300 BESTCOMS to trigger and save a record of a voltage step response during commissioning. Once commissioned, a logic trigger or level trigger can be used to activate the data recorder to capture the occurrence for review at a later time. DECS-300 alarms can also be used to start the data recorder. When an alarm condition occurs, an oscillographic record can be stored. A level trigger will initiate a record to be saved when a variable exceeds a predetermined setting. An example of this is when the exciter field current exceeds a predetermined setting.

The oscillographic records are recorded in accordance with the IEEE Standard Common Format for Transient Data Exchange (COMTRADE) or Log file format. Basler Electric can provide BESTWAVE, a COMTRADE viewer, which is a program that will allow the user to view the oscillography records saved by the DECS-300.

Communications

DECS-300 comes complete with Windows® based PC software. This software makes the programming and customization of the DECS-300 easy and fast. The software comes with a PID selection program that allows the user to select stability settings quickly and easily in a user-friendly format. The PC software has a special monitoring function that allows the user to view all settings, a metering screen for viewing all machine parameters, and a control screen for remote control of the excitation system.

The rear-mounted RS-485 port supports Modbus™ communications protocol. This is an open protocol with all registers and operating instructions available in the instruction manual, to make it simple for the user to develop custom communications software.

Password Protection

All DECS-300 parameters are viewable via the front panel LCD display, the PC software or via Modbus™ without the need of a password. If the user wishes to change a setting, the proper password must be entered to allow access to the parameter. Two levels of password protection exist, one for global access of all parameters and one for a limited amount of access to parameters normally associated with operator control.
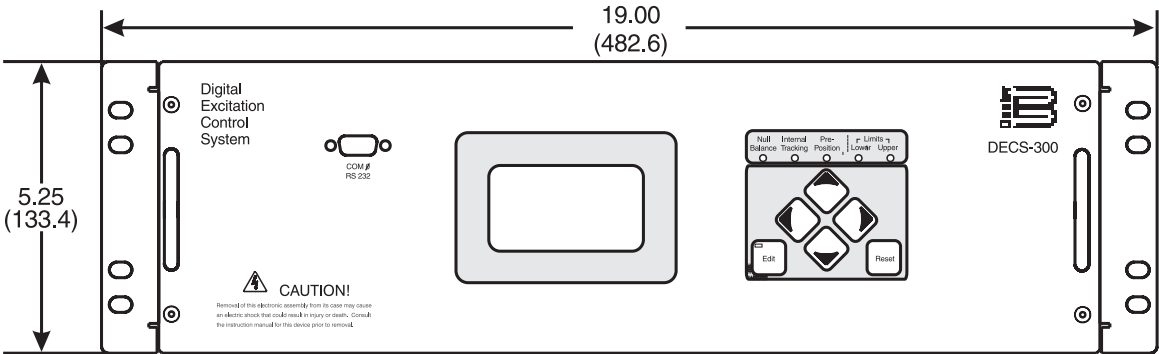

Figure 1 - Dimensions, Front view
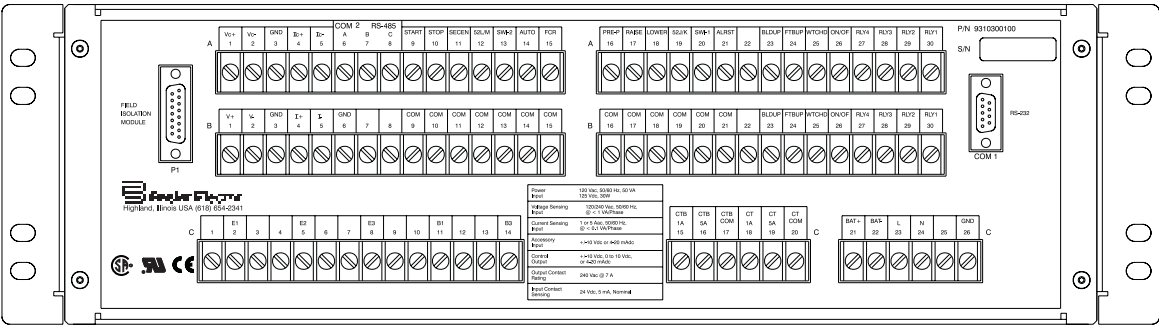**Depth: 12.15" (308.6mm); 13.4" (340.4mm) including handle**
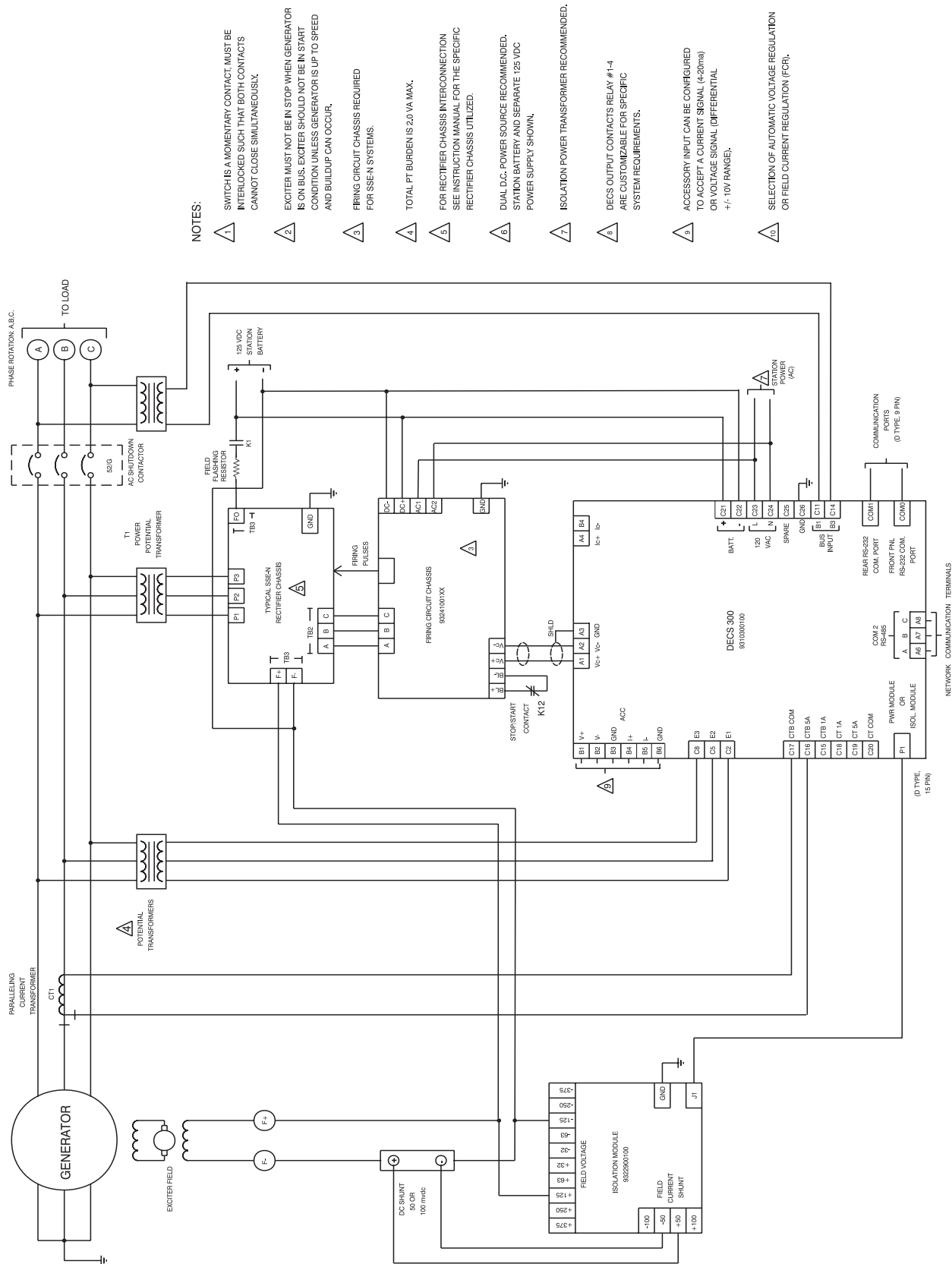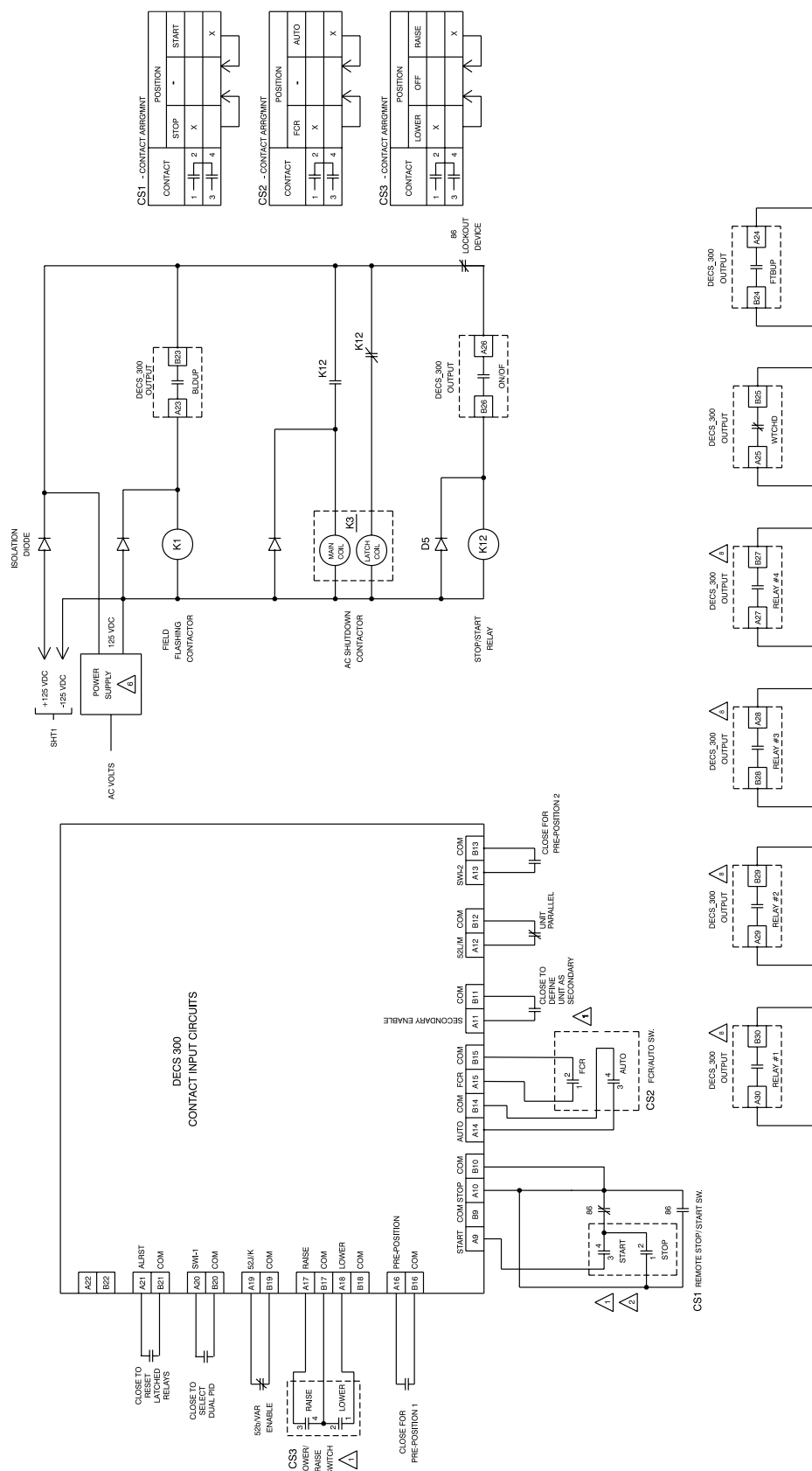

Figure 2 - Rear Panel View

CONNECTIONS

NOTES:

1. SWITCH IS A MOMENTARY CONTACT. MUST BE INTERLOCKED SUCH THAT BOTH CONTACTS CANNOT CLOSE SIMULTANEOUSLY.

2. EXCITER MUST NOT BE IN STOP WHEN GENERATOR IS ON BUS. EXCITER SHOULD NOT BE IN START CONDITION UNLESS GENERATOR IS UP TO SPEED AND BUILDUP CAN OCCUR.

3. FIRING CIRCUIT CHASSIS REQUIRED FOR SSE-N SYSTEMS.

4. TOTAL PT BURDEN IS 2.0 VA MAX.

5. FOR RECTIFIER CHASSIS INTERCONNECTION SEE INSTRUCTION MANUAL FOR THE SPECIFIC RECTIFIER CHASSIS UTILIZED.

6. DUAL D.C. POWER SOURCE RECOMMENDED. STATION BATTERY AND SEPARATE 125 VDC POWER SUPPLY SHOWN.

7. ISOLATION POWER TRANSFORMER RECOMMENDED.

8. DECS OUTPUT CONTACTS RELAY #1-4 ARE CUSTOMIZABLE FOR SPECIFIC SYSTEM REQUIREMENTS.

9. ACCESSORY INPUT CAN BE CONFIGURED TO ACCEPT A CURRENT SIGNAL (4-20ma) OR VOLTAGE SIGNAL (DIFFERENTIAL +/- 10V RANGE).

10. SELECTION OF AUTOMATIC VOLTAGE REGULATION OR FIELD CURRENT REGULATION (FCR).

Figure 3 - Typical AC Connection Diagram

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CONNECTIONS, continued

Figure 4 - Typical DC Connection Diagram
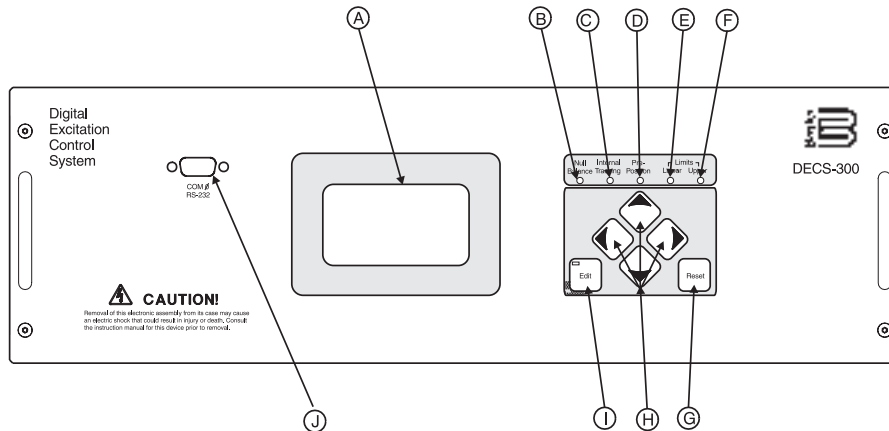
FRONT PANEL HMI

The front panel HMI (Human Machine Interface) is composed of several elements, including a backlit LCD screen, six pushbuttons and six LEDs. The LCD is the primary interface because it conveys the majority of the information between the DECS-300 and the user/operator. Front panel pushbuttons allow the user to view menu screens and modify the various screen settings and operating conditions. The LEDs annunciate their respective states.

A) 64x128 pixel graphic LCD with backlighting. Primary source for receiving information from the DECS or when locally programming settings. Displays operations, setpoints, loop gains, metering, protection functions, system parameters and general settings.

B) Null Balance LED – Turns ON when the inactive modes (AVR, FCR, VAR, or PF) match the active mode.

C) Autotracking LED – All inactive modes (AVR, FCR, VAR, or PF) track the active mode to accomplish the bumpless transfer when changing active modes.

D) Pre-Position LED – Turns ON at the predefined setting (within the limits of the setpoints) of the current mode.

E) Lower Limit LED – Turns ON at the minimum set point value of the current (active) mode.

F) Upper Limit LED – Turns ON at the maximum set point value of the current mode.

G) Reset Pushbutton – Cancels editing sessions and can be used as a quick-access to the metering screen.

H) Scrolling Pushbuttons – Scrolls UP/DOWN/LEFT/RIGHT through the menu tree or when in the EDIT mode, the LEFT/RIGHT scrolling pushbuttons select the variable to change and the UP/DOWN scrolling pushbuttons change the variable.

I) Edit Pushbuttons – Enables settings changes. When the EDIT pushbutton is first pushed, an LED on the pushbutton turns ON to indicate the edit mode is active. When changes are complete (using the scrolling pushbuttons) and the EDIT pushbutton is pushed again, the LED turns OFF, indicating the changes are saved. If changes are not completed and saved within five minutes, the edit mode is exited without saving changes.

J) Serial Port COM0 – D-type 9 pin connector. This port is dedicated to RS-232 (ASCII commands) communication with a computer terminal or PC running a terminal emulation program such as BESTCOMS.
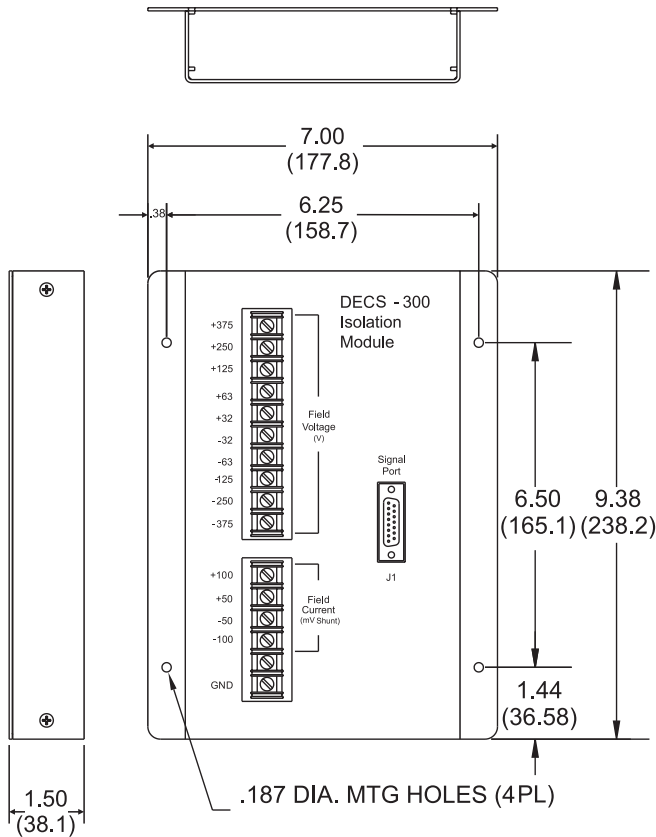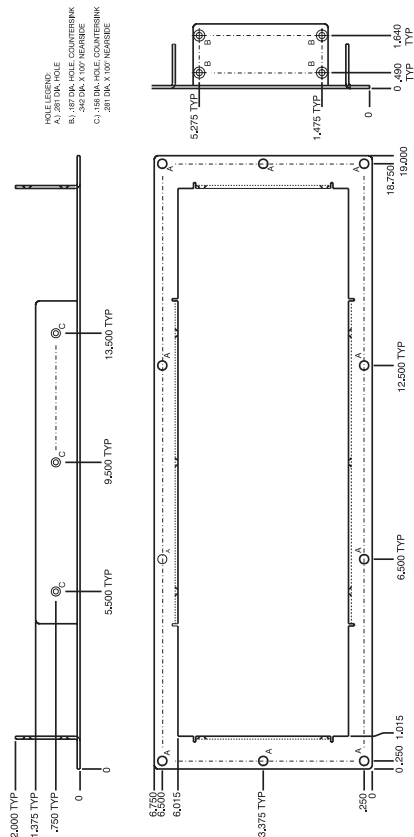
Figure 5 -Dimensions, Isolation Module

Figure 6 - Front Panel Cutout Dimensions
(Optional front panel mounting bracket,
Basler P/N 9310304100)

HOW TO ORDER

The DECS-300 is available in one of two power supply ranges. Model number designations are shown at right.

Model	Power Supply
DECS-300-L	24/48 Vdc
DECS-300-C	120/125 Vac/Vdc

ACCESSORIES

• Front panel mounting bracket, Basler P/N 9310304100.
• Interconnection cable for dual DECS-300 applications, Basler P/N 9310300032.
• RDP-300 Remote Display Panel is a Human-Machine Interface (HMI) used to provide remote control, view metered quantities, and provide annunciation of system status and alarms available from the DECS-300 system. The RDP-300 features a touch-sensitive 6" diagonal monitoring screen, two-wire RS-485 Modbus™ communication protocol, and may be located up to 4000 feet away from the DECS-300. For more details, see Product Bulletin SNE.

Basler Electric