



*Multifunction recloser system for distinct single and three phase programs.*

### Features and Benefits

- Manual closing supervision (up to 2 breakers)
- Standard 19" rack case packing
- 7 reclosing programs
- Closing and reclosing conditions:
  - voltage synch. check
  - undervoltage (DL-DB, DL-LB, LL-DB)
  - external input
- Closing/reclosing accumulative counters per breaker
- 3 settings tables
- Configurable inputs/outputs
- Self-checking functions

### Applications

- Single-phase and three-phase recloser
- One or two breakers (simultaneous or sequential) reclosing schemes
- Any kind of busbar arrangement

### Protection and Control

- Pole disagreement
- Independent trip and alarm outputs

### Monitoring and Metering

- Event record, last 165 events
- Oscillography for internal flags
- Busbar and line voltage measurement (up to 4 voltage and frequency values)
- On-line breaker status (2 breakers x 3 poles)

### User Interfaces

- Alphanumeric LCD
- RS232, plastic or glass fiber optics
- Time synchronization (PC or GPS synch.)
- 17 LEDs (16 programmable)
- Configurable alarms



## Functionality

### Recloser

The recloser portion of the DRS provides both single pole and three pole reclosing for one or two breakers. The reclosing sequence can be set to any of 7 programs:

- R1 - LO
- R3 - LO
- R1 - T3 - LO
- R3 - T3 - LO
- R1 - LO or R3 - LO
- R1 - T3 - LO or R3 - T3 - LO
- R1 - T3 - LO or R3 - LO

R1 = Single pole reclose

R3 = Three pole reclose

T3 = Second step three pole reclose

LO = Lock-out.

The reclosing sequence is started by the receipt of a reclose initiation signal. After the set time delay, a reclose output is issued. If only one shot has been chosen, the recloser will go to lockout if a second initiation input is received

prior to the expiration of the reset time. If two shots have been chosen, a second delayed shot will precede the lockout state. The recloser can be reset from lockout using a command or automatically after a set time. Manual closing can be done energizing an input to the DRS. Closing conditions will be directed by the DRS (voltage synchrocheck, DL-DB, DL-LB, LL-DB, external input).

## Features

### Pole Disagreement

A pole disagreement tripping or alarm output per breaker is provided. The function supervises the breaker auxiliary contacts (per phase) status and with a timer supervision, determines if a pole disagreement condition exists.

### Closing/Reclosing Conditions

Conditions are independently set for closing and for reclosing, per breaker. Closing/reclosing condi-

tions checked by the DRS are:

- Voltage synchrocheck: verifies the magnitude, phase angle and frequency difference between the two voltage signals at both sides of the breaker
- Undervoltage conditions: Dead Line-Dead Bus, Dead Line-Live Bus, Live Line-Dead Bus (Dead/Live voltage levels are defined by settings)
- External permission: a digital input can be used to permit the closure/reclosure

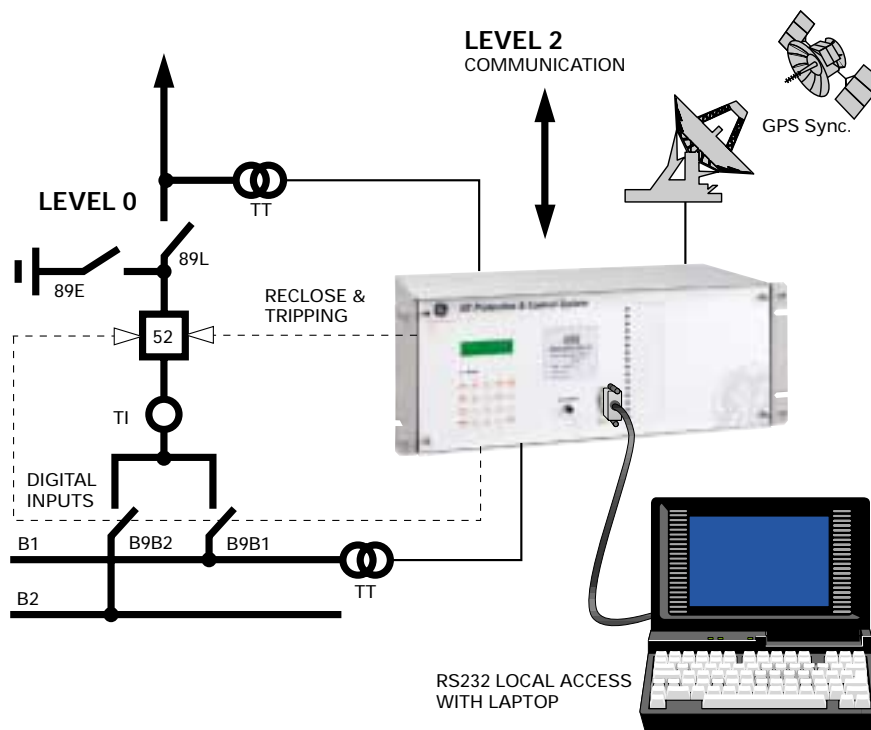
### Outputs

The DRS has independent output configurable contacts per breaker. Additionally, alarm outputs are provided.

### Easy to Configure

The DRS is configured using GE-INTRO software. This is a graphical Windows® based program that allows easy configuration. No training or programming skills are required.

DRS with remote communication access.



## Monitoring

### Continuous Metering

On-line voltage (magnitude and angle) and frequency metering for each voltage value (line/bus) associated to one of two breakers.

### Breaker Status

DRS displays up to 2 breaker status with information per pole.

### Event Record

The DRS stores up to 165 events with the date and time stamped to the nearest millisecond. This provides the user with the information needed to determine the sequence of events, speeding diagnosis and system recovery. Events consist of a broad range of state occurrences including trips and alarm contact operations.

### Oscillography

The DRS stores 4 oscillography records, 264 cycles each. Each record includes, at 4 samples per cycle, the following information:

- The 4 voltage inputs (VL1, VB1, VL2, VB2)
- The status of each reclosing automatically
- All internal digital flags

DRS performance can be analyzed using the GE-OSC and DRSTool software packages.

## User Interfaces

### Keypad and Display

The front of the DRS has a keypad and a backlit LCD. This allows the user to easily display metering data, settings and other information.

### LED Indication

The DRS includes 17 LED indicators on the front panel. 16 red LEDs are user configurable, while a two-color LED reports system in service information.

## Communication Ports

**LOCAL COMMUNICATION PORTS:** A nine pin RS232 serial port (Port 1) is located on the front of the relay and another one on the rear. It allows the user easy access with a laptop computer to get events, access settings, metering information, etc.

**REMOTE COMMUNICATIONS PORT:** One serial port is provided on the rear of the unit. This can be either an RS232, an RS485 port or a fiber optical port (glass or plastic). The ports may be set independently for different data rates from 1,200 to 19,200 bps.

### Time Synchronization

An IRIG-B input is provided which permits the relay to synchronize its clock. This ensures that all event time stamping is consistent across the entire system.

### Software

Two Windows® based software packages are included with the DRS:

- GE-LOCAL enables the user to visualize the protection settings, alarms, LEDs, measurements and status
- GE-INTRO enables the user to configure the inputs, outputs and LEDs

Optionally GE-OSC AND DRSTOOL enable the user to study the oscillography records.

These software packages are part of the GE-NESIS software (GE NETwork Substation Integration System) used by the DDS system.

## DRS Technical Specifications

MONITORING	
<b>Recloser Timers:</b>	
R1 Reclose:	0.01-60 sec in 0.01 sec steps
R3 Reclose:	0.01-60 sec in 0.01 sec steps
T3 Reclose:	0.1-256 sec in 0.1 sec steps
Reclaim Time:	0.1-256 sec in 0.1 sec steps
Reset Time:	0.1-256 sec in 0.1 sec steps
<b>Synchronism Check:</b>	
Module:	2-90 V in 1 V steps
Angle:	2°-89° in 10° steps
Frequency:	0.01-2 Hz in 0.1 Hz steps
Timer:	0.01-60 sec in 0.5 sec steps
<b>Pole Disagreement:</b>	
Timer:	0.1-256 sec in 0.1 sec steps

INPUTS	
Voltage:	V <sub>n</sub> = 90-220 VAC
<b>Thermal Ratings:</b>	
Continuous:	2 x V <sub>n</sub>
1 min:	3.5 x I <sub>n</sub>
Frequency:	50 or 60 Hz
Auxiliary DC:	48/125 or 100/250 VDC
DC Inputs:	48, 125, 220 VDC
AC Burden:	0.2 VA (V <sub>n</sub> = 90 V)
DC Burden:	12 W, 8 mA per input

COMMUNICATIONS	
Mode:	Half duplex
Speed:	1200 to 19200 bps
<b>Physical Media:</b>	
RS232	
Plastic Fiber Optic	
Type of connector:	HFBR-4516
Power supplied:	-8 dBm
Receiver's sensitivity:	-39 dBm
Wave length:	660 nm
Glass Fiber Optic	
Type of connector:	STA
Power supplied:	-17.5 dBm
Receiver's sensitivity:	-24.5 dBm
Wave length:	820 nm
RS485 (port 2 optional)	

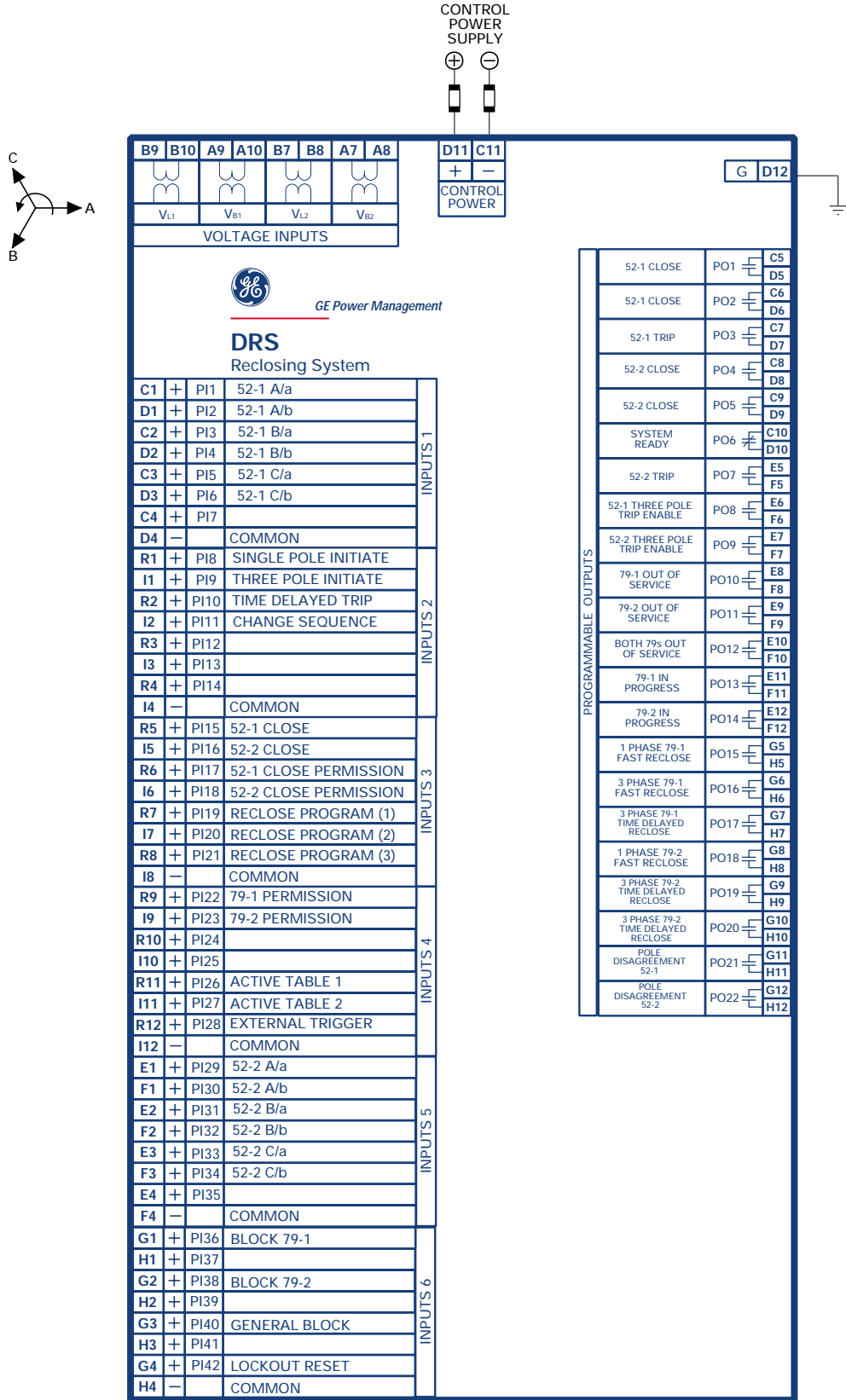
ENVIRONMENTAL	
<b>Ambient Temperature Range:</b>	
Storage:	-40°C to +55°C
Operation:	-20°C to +70°C
Humidity:	Up to 95% without condensing

TYPE TESTS	
Insulation Test Voltage:	2 kV, 50/60 Hz, one min
Impulse Voltage Withstand:	5 kV peak, 1 V 50 μsec, 0.5 J
Interferences:	IEC 255-22-1 class III
Electrostatic Discharges:	IEC 255-22-2 class IV and EN 61000-4-2, 8 kV
Radiated Interference:	ENV 50140, ENV50141, ENV50204, 10 V/m
Fast Transient:	IEC 255-22-4 and EN 61000-4-4, class IV
Magnetic Fields at Industrial Frequency:	EN 61000-4-8, 30 Av/m
RF Emission:	EN 55011, class B

APPROVALS	
CE Compliant	UL - UL listed for USA and Canada

\*Specifications subject to change without notice.

# Typical Wiring



736750A1.ai

## Ordering

DRS 1\*00 \* C0 \* 001 \* \*

DRS					Numerical single-phase and three phase reclosing system
0					P1, P2, P3: M-Link protocol
2					P1, P2: M-Link protocol; P3: ModBus® RTU protocol
	0				RS232 communications
	1				1 mm plastic fiber optic communications
	2				62.5/125 glass fiber optic communications
	3				RS485 communications
		G			48-125 VDC auxiliary voltage
		H			110-250 VDC auxiliary voltage
			A		Revision level
				-	Spanish language
				I	English language

