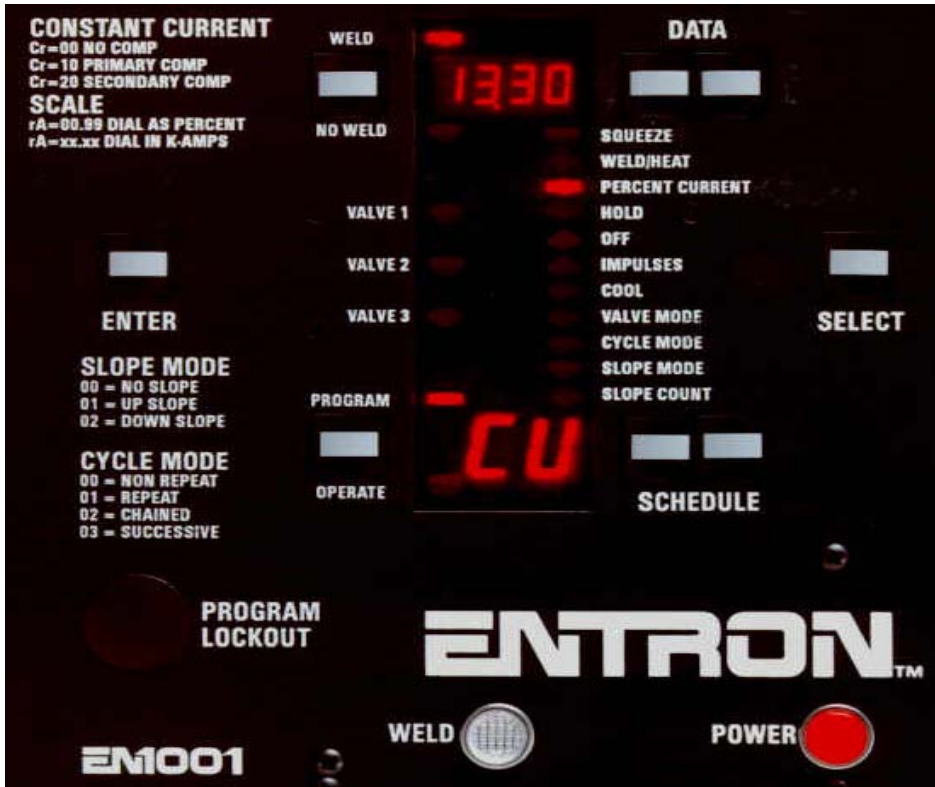


# ENTRON™

## Controls for Resistance Welding EN1001

### Constant Current/Multiple Sequence Controls



#### Features

- Spot Sequence
- Pulsation Sequence
- Seam Sequence
- Up & Down-Slope
- Chained & Successive Modes
- External Schedule Select
- Process & Error Outputs
- Five Programmable Stepper Counters
- 50 Schedules
- Repeat / Non Repeat
- 3 Valve Outputs
- Schedule to Schedule copy

#### Capabilities

- Extended Functions accessible via the Front Panel make Board-mounted dipswitches virtually obsolete
- Front Panel layout permits quick access to all needed parameters
- Program only functions required
- Multiple weld programs
- Multiple current sequence
- Pre-Heat / Post Heat
- Multiple job schedule storage
- Quench and Temper
- Flash / Butt Welding
- Diverse schedule capabilities provide maximum application versatility

#### Constant Current

##### Current Sensors:

Secondary Flexible Rogowski Coil or Primary Coil.

Secondary Flexible Rogowski Coil permits direct secondary kilo-Ampere programming and reading. Monitoring with High and Low limits.

Automatic Tap Up/Range Down or Tap Down/Range Up indicator.

Toggle function displays kilo-Ampere or Percent Current. Function helps avoid setups in very low or very high percent phase shifts.

All sensors permit Current Monitoring with High and Low limits.

Simple secondary range setting requires no setup. Secondary operating range of 2kA to 100kA.

Quick primary setup. Control learns and adapts to any machine size when primary sensing is used.

Welding Transformer ratio measurements not required for proper Constant Current Operation in percent mode with primary sensor.

Secondary ampere programming is available when a primary sensor is used and transformer ratio is provided.

*Exclusive ENTRON two year warranty*

**Expanded Capabilities  
(Requires additional hardware)**

•**Schedule Select 49 [S49] Option.** Allows direct binary selection and initiation of any of 50 schedules in Spot Mode. Switch Weld Current on the fly to any of 50 currents in Seam Mode.

•**IPSC Options**  
**Integrated Pressure Control [IPC].** Weld Control stores an independent value of Pressure or Force in each of 50 Schedules. Associates Pressure with Squeeze time for concurrent valve actuation.

**Integrated Pressure Sensing [IPS].** Weld Control stores an independent value of Pressure or Force in each of 50 Schedules. Associates sensed Pressure with Pressure Switch input for Pressure/Force level weld triggering.

**Integrated Pressure Sense and Control [IPSC].** Weld control combines the previous two options into a full pressure control and monitoring system.

•**RS485 Communication.** Control can be networked along with 63 other units for remote programming and monitoring. Up to 32 Masters allow for grouping within a network. Up to 32 PC hosts allow for programming or statistical data collection or error monitoring.

•**RS232** provides Serial communication.

•**ENLINK for WINDOWS** Communication software provides PC and Laptop interface for remote programming and monitoring of EN1001 series controls. ENLINK for WINDOWS Communication software is included with RS485 option.

•**Memory Module [MM2]** is designed as a backup device for any EN1001 series control or as Copy/Download device for all Data from one Control to another.

•**Valve Select 1 of 7 [VS].** This option provides 7 additional decoded outputs from the 3 standard EN1001 series controls.

D Cabinet



E Cabinet



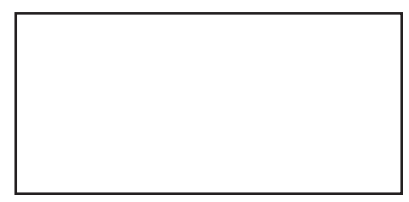
S Cabinet



Primary Coil (P5)



Rogowski Coil (S6)



**ENTRON™**  
ENTRON Controls, LLC.



**T. J. SNOW CO., INC.**  
1-800-NOW-SNOW  
<http://www.tjsnow.com>

# ENTRON™

## EN1001 Series Controls Constant Current/Multiple Sequence Controls

Date: July 2007

Supersedes: April 2006

### SPECIFICATIONS

#### Constant Current Operation

- Primary or Secondary Sensing with 2 Sensors available: Primary Coil or Secondary Coil
- Secondary Coil Calibrated for full range of operations from 2kA to 100kA requires no setup or learning
- Control achieves Compensation on Second weld cycle
- Compensation algorithms permit 1% accuracy
- Current readings available at end of weld; Percent phase shift reading available by the push of a button
- Intelligent error reporting associates weight of error versus weld time when using Hi/Lo windows
- Primary or Secondary Sensors permit users a choice for simple and accurate constant current operation
- Control is programmable in Percent Phase shift or kAmps
- Current Monitoring only mode, can monitor 1/2 cycle welds

#### Absolute Count: Push Button Data Entry with Display

- Squeeze Count: 0 to 99 cycles, 50/60 Hz
- Squeeze: Pressure/Force 00 to 99psi/0000 to 9999 Lbs.
- Trigger value 00 to 99psi/0000 to 9999 Lbs.
- Weld Count/Heat Count: 0 to 99 cycles, 50/60 Hz
- 5 Steppers each with 10 steps counting up to 9999 welds.
- Cool Count: 0 to 99 cycles, 50/60 Hz
- Hold Count: 0 to 99 cycles, 50/60 Hz
- Off Count: 0 to 99 cycles, 50/60 Hz
- Weld Impulse Counter: 1 to 99 cycles, 50/60 Hz
- Slope Control/Up and Down Slope: 0 to 99 cycles, 50/60 Hz

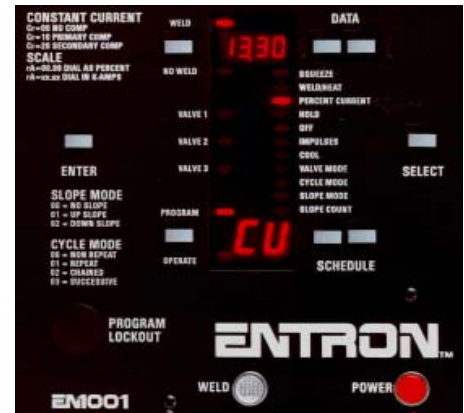
#### Current Programmability in KiloAmps/Percent up to 99.99kA/99% in 0.01kA/1% current steps.

#### Standard RWMA/NEMA Programmable Functions

- Up Slope and Down Slope Stepper
- Quench and Temper Forge Delay
- Pulsation Sequence Pre-Heat/Post Heat
- Multi-Schedule Select End of sequence
- Seam Weld (Continuous and Intermittent) Air over oil
- Retraction

#### 5 Cycle Modes

- Non-Repeat: Single Schedule upon initiation
- Repeat: Single Schedule repeated with pilot circuit held closed
- Successive: Upon each initiation, unique successive schedules are automatically selected
- Chained: Multiple schedules can be linked to operate sequentially upon a single initiation
- Paused Chain: Valves remain active after HOLD until Re-initiation to next schedule in sequence



#### Additional Features

- Error Code/Fault Outputs
- 87° First Half Cycle Delayed Firing,
- Anti-Saturation Circuit
- Anti Tie Down
- Temperature Limit Switch
- Dynamic Automatic Power Factor Equalization
- Dynamic Automatic Voltage Compensation,  $\pm 20\%$  of Nominal Line
- Current Offset
- Emergency Stop Circuit
- Interlocking Pressure Switch Circuit
- Single Stage Pilot/2 Stage Pilot Beat/Non-Beat Operation
- Operational Lights: Power On Weld Voltage
- Indicator lights for all functions on display panel
- Valve Transformer: 150VA 230/460-115V, E, D & T Cabinets; 50VA 230/460-115V, S Cabinets
- 3 Valve Outputs standard, all controls except 1001B.

#### Options:

- Valve select 1 of 7
- S49, External Binary Schedule Select
- IPSC, Integrated Pressure Sense Control
- MM2, Memory Module
- RS485 with ENLINK or RS232
- Water Flow Switch
- Shunt Trip Disconnect
- Ground Fault Detection

*Exclusive ENTRON two year warranty*

# EN1001 Series Controls

## Constant Current/Multiple Sequence Controls

D Cabinet



E Cabinet



S Cabinet



The EN1001 Series Constant Current Control is ideal for programming schedules where changing conditions such as line voltage variation, size and shape of the secondary, or the introduction of ferrous material in the secondary are of concern and current compensation is desired.

- CONSTANT CURRENT with a 4 digit display in kAmps
- Store up to 50 UNIQUE SCHEDULES
- Schedules retained in memory with power off
- Three Valve Circuits, standard
- Single contactor Firing Circuit
- External Schedule Select allows remote binary selection of 4 schedules
- Five Programmable Steppers to extend tip life
- Current Offset allows quick manual current adjustments
- Control can be interfaced and initiated using a PLC (Programmable Logic Controller)
- Meets or exceeds RWMA/NEMA standards
- Secondary coil requires No Setup; Only range selection for constant current
- Primary sensor requires No Transformer Ratios
- Current monitor with Hi/Lo current limit windows

### OPTIONS:

- RS485 implemented with 2 wire ENBUS using non-proprietary protocol; Controls can be networked through remote terminals (RT4jr.) or use PC compatible ENLINK software to download, store or edit weld control data
- RS232 Single point communications
- IPS, IPC, IPSC, Integrated Pressure Sense, Control or Sense and Control Program 50 Unique Pressures, or Trigger Levels
- MM2, Memory Module provides backup for all data of EN1001 Series Controls
- S49, External Binary Select, allows remote binary selection of any of 50 schedules
- Valve Select 1 of 7
- Shunt Trip Breaker
- Ground Fault Detection

CABINET STYLE & DIMENSIONS				CONTACTOR STYLE & RATINGS				
STYLE	H	W	D	AIR COOLED		WATER COOLED		
B	222 mm • 8-3/4"	222 mm • 8-3/4"	296 mm • 11-3/4"	150A	300A			
S	222 mm • 8-3/4"	222 mm • 8-3/4"	419 mm • 16-1/2"		300A			
E	533 mm • 21"	222 mm • 8-3/4"	419 mm • 16-1/2"		300A	1200A	1800A	2200A
D or T	610 mm • 24"	645 mm • 25-3/8"	254 mm • 10"		300A	1200A	1800A	2200A

All SCR contactors complete with temperature limit switch.

Consult factory for Circuit Breaker pricing. 100, 200 and 400 ampere Circuit Breakers are available in D & T cabinets with right-hand, flange mounted operator installed within the cabinet. Consult factory for availability of 600 and 800 ampere Circuit Breaker. See COMPREHENSIVE PRICE LIST for a complete list of Options, Circuit Breakers, Accessories and Special Features.



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