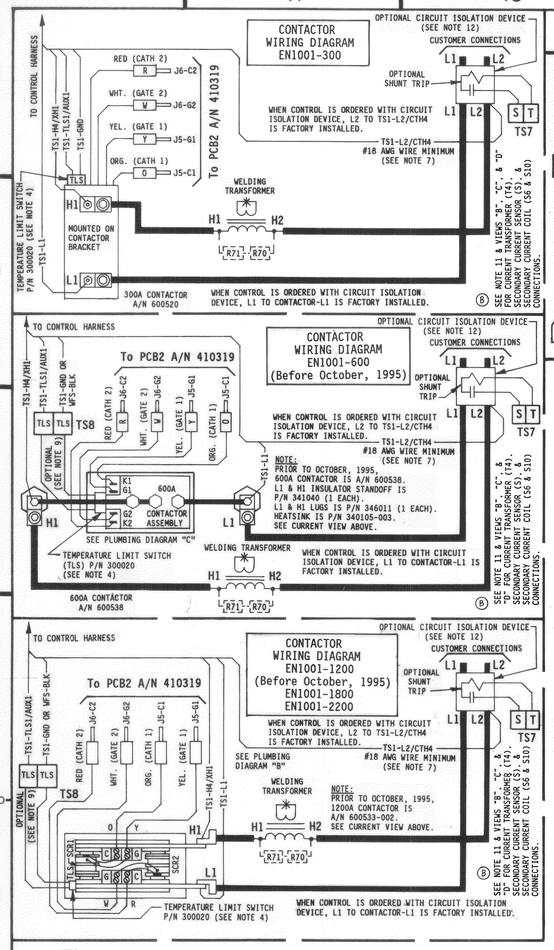
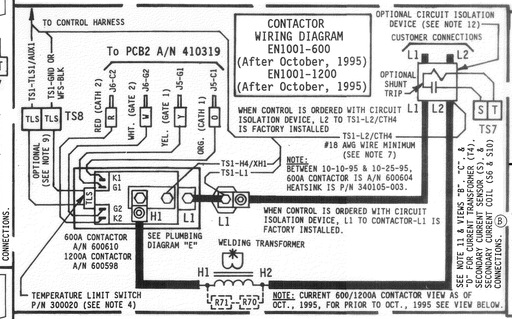
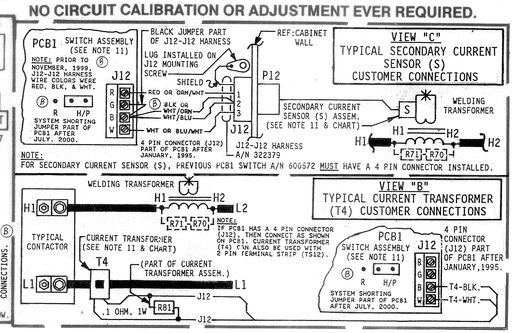
CAUTION - READ MANUAL & ALL NOTES BEFORE INSTALLING OR OPERATING CONTROL. SEE NOTE 1.
NO CIRCUIT CALIBRATION OR ADJUSTMENT EVER REQUIRED.



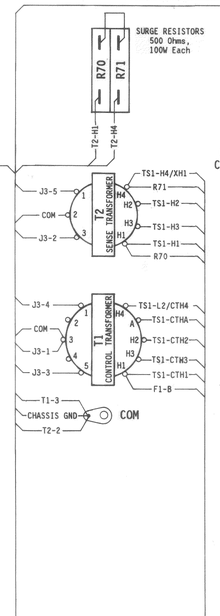


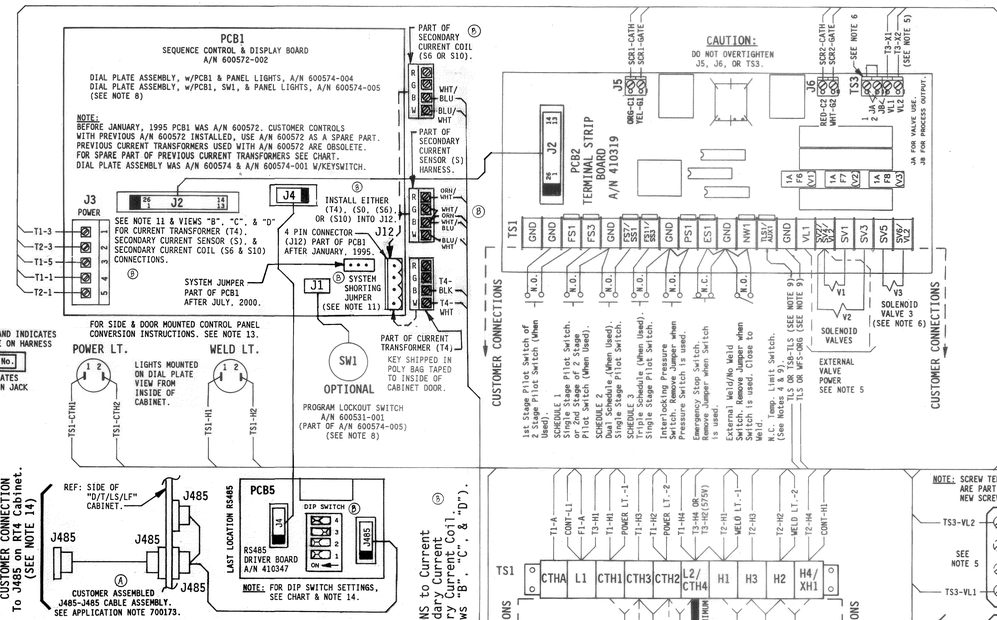


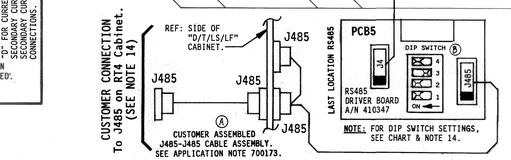
DANGER
HAZARDOUS VOLTAGE FROM ONE OR MORE SOURCES
Turn off all voltage sources before touching any components.
Electrical shock or flash will cause severe injury or death.

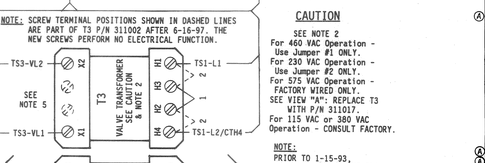
NOTICE
FOR SERVICE ON THIS CONTROL
Contact Your Machine Dealer Or
ENTRON CONTROLS INC.
DIRECTLY:(630) 682-9600
485 EAST RANDY ROAD
CAROL STREAM, IL 60188
FAX # (630) 682-3374

CAUTION
Control Shipped Wired for 460 VAC Operation unless otherwise specified - See Note 2.





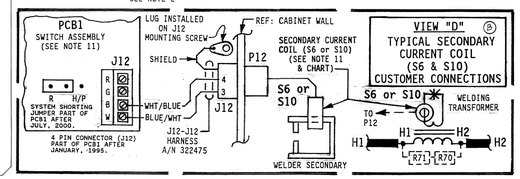


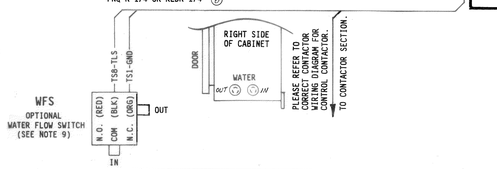


CAUTION
SEE NOTE 2
For 460 VAC Operation - Use Jumper #1 ONLY.
For 230 VAC Operation - Use Jumper #2 ONLY.
For 575 VAC Operation - FACTORY WIRED ONLY. SEE VIEW "A". REPLACE T3 WITH P/N 311017.
For 115 VAC or 380 VAC Operation - CONSULT FACTORY.
NOTE: PRIOR TO 1-15-93, OPTIONAL 575V VALVE TRANSFORMER (T3) WAS P/N 311007. WIRE FROM TS1-L2/CTH4 WAS CONNECTED TO T3-H3. T3-H3 SCREW POSITION WAS IN SAME LOCATION AS T3-H2.
NOTE: SCREW TERMINAL POSITIONS SHOWN IN DASHED LINES ARE PART OF 575V VALVE TRANSFORMER (T3) P/N 311017 AFTER 6-16-97. THE NEW SCREWS PERFORM NO ELECTRICAL FUNCTION.

CAUTION
SEE NOTE 2
For 460 VAC Operation - Use Jumpers #1.
For 230 VAC Operation - Use Jumpers #2.
For 575 VAC Operation - FACTORY WIRED ONLY. Jumper #1 is used between H2 & H3 Jumper #1 between CTH2 & CTH3 is removed & replaced by resistor, R74 (2000 Ohm, 10 Watt).
For 115 VAC or 380 VAC Operation - CONSULT FACTORY.

CAUTION - CONTROL WIRED FOR 460 VAC OPERATION - UNLESS OTHERWISE SPECIFIED.





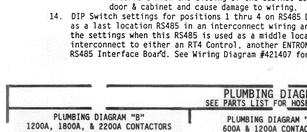
NOTES:

1. It is recommended that control wiring (i.e.: initiation, pressure switch, etc.) be physically separated from the high voltage wiring (115 volts or higher).
2. For 460 VAC Operation - Use Jumper #1 on T3 & TS1. As shipped unless otherwise specified.
   For 230 VAC Operation - Use Jumper #2 on T3 & TS1.
   For 575 VAC Operation - FACTORY WIRED ONLY. SEE VIEW "A".
   Replace T3 with P/N 311017. Wire per view "A". Use Jumper #1 between H2 & H3 on TS1.
   Use Resistor R74 (2000 ohm, 10 Watt) in place of Jumper #1 between CTH2 & CTH3 on TS1.
   For 115 VAC or 380 VAC Operation - CONSULT FACTORY.
3. For Single Stage Pilot Operation - Connect pilot switch to TS1-FS3 & TS1-GND.
   No Jumpers required across TS1-FS1 & TS1-GND.

   For Two Stage Pilot Operation - Connect 1st Stage Pilot Switch to TS1-FS1 & TS1-GND.
   Connect 2nd Stage Pilot Switch to TS1-FS3 & TS1-GND.

   For DUAL COUNT/DUAL CURRENT (Dual Weld/Dual Heat) or TRIPLE COUNT/TRIPLE CURRENT (Triple Weld/Triple Heat) or External Schedule Selection, SEE MANUAL.
4. EN1001-SERIES, "D/T/LS/LF" CABINET:
   ENTRON supplies Temperature Limit Switch (TLS) P/N 300020 and provides connections to TS1-TLS1/AUX1 & TS1-GND. Jumper not required between TS1-TLS1/AUX1 & TS1-GND.
   NOTE: TLS Thyristor will open at temperatures greater than or equal to 150 F.
5. When external valve power is supplied to the control. Remove and insulate leads TS3-VL1 & TS3-VL2 on the Terminal Strip Board (PCB2). (from T3-X1 & T3-X2). Connect external AC power supply (24-240 VAC) to TS1-VL1 & TS1-SV2/SV4/VL2.
   CAUTION: Do NOT overtighten TS3.
6. VALVE 3 OUTPUT USAGE:
   TS1-SV5 & TS1-SV6 (Valve 3) can be used for either a Valve output or a Process output.
   When TS1-SV5 & TS1-SV6 is used as a Valve output use Jumper "JA" on TS3.
   When TS1-SV5 & TS1-SV6 is used as a Process output use Jumper "JB" on TS3.
   CAUTION: Do NOT overtighten TS3.

   WARNING: Use of Jumper "JB" bypasses control relay contacts to allow a process output without an initiation. SEE MANUAL.
7. Connect TS1-L2/CTH4 to L2/H2 side of Welding Transformer Primary. (Factory wired on controls supplied with Circuit Isolation Device).
8. When Optional Program Lockout Switch is specified by customer. Dial Plate A/N 600574-005 replaces A/N 600574-004. Add Switch P/N 600531-001 & remove Hole Plug P/N 565003.
9. When TLS and WFS are used together, add WFS P/N 600297 & Terminal Strip TS8 P/N 335017. Wire as shown below. Jumper not required between TS1-TLS1/AUX1 & TS1-GND. WFS will open with flows less than .75 GPM.



10.

11. CURRENT TRANSFORMER (T4) CONNECTIONS:
    Wire per view "B". Current Transformer coil (T4) shown installed on L1, may be installed on H1. Wires from Current Transformer (T4) to J12 should be kept as short as possible.
    SECONDARY CURRENT SENSOR (S) CONNECTIONS:
    Wire per view "C". Secondary Current Sensor (S) may be used in place of Current Transformer (T4). Add J12-J12 Harness A/N 322379.
    NOTE: Secondary Current Sensor (S) can ONLY be used with PCB1 A/N 600572-002 or A/N 600572 that has a 4 pin connector (J12) installed.
    SECONDARY CURRENT COILS (S6 & S10) CONNECTIONS:
    Wire per view "D". Secondary Current Coils (S6) & (S10) may be used in place of Current Transformer (T4). Add J12-J12 Harness A/N 322475.
    NOTE: Secondary Current Coils (S6) & (S10) can ONLY be used with PCB1 A/N 600572-002 at revision "Z" or any revision there after.
    AFTER JULY, 2000:
    Sequence Control/Display Board A/N 600572-002 (PCB1) revision "Z" or any revision there after MUST have the System Shorting Jumper installed into the correct two (2) pins for usage with either a Current Transformer (T4), Secondary Current Sensor (S), or Secondary Current Coils (S6 & S10). See applicable View "B", "C", or "D" for correct Jumper installation.

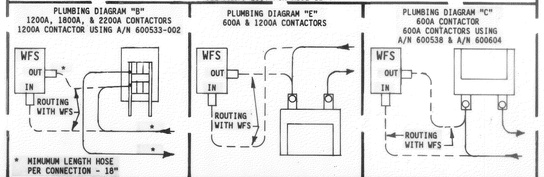
CURRENT SENSING COIL/SENSOR APPLICATION CHART (B)

COIL/SENSOR MODEL NUMBER	CURRENT TRANSFORMER OR SECONDARY CURRENT SENSOR A/N & CABINET USED: "D/T" CABINET	"LS/LF" CABINET	CONTACTOR SIZE 300A CONT.	600A CONT.	1200A CONT.	1800A CONT.	2200A CONT.
P2 - 200:5	#600575 OBSOLETE	#600575-001 OBSOLETE	X				
P2 - 200:5	#600575-002 OBSOLETE (USED w/600572-002)		X				
P2 - 200:5	#600575-004	#600575-003	X				
P5 - 500:5	#600576 OBSOLETE	#600576-001 OBSOLETE	X	X	X	X	
P5 - 500:5	#600576-002 OBSOLETE (USED w/600572-002)		X	X	X	X	
P5 - 500:5	#600576-004	#600576-003	X	X	X	X	
P10 - 1000:5	#600577 OBSOLETE	#600577-001 OBSOLETE		X	X	X	X
P10 - 1000:5	#600577-002 OBSOLETE (USED w/600572-002)			X	X	X	X
P10 - 1000:5	#600577-004	#600577-003		X	X	X	X
S	#600590 & #322379	#600590 & #322379	X	X	X	X	X
S6	#600467 & #322475	#600467 & #322475	X	X	X	X	X
S10	#600468 & #322475	#600468 & #322475	X	X	X	X	X

X = ONE CURRENT TRANSFORMER ASSEMBLY, ONE SECONDARY CURRENT SENSOR ASSEMBLY, OR ONE SECONDARY CURRENT COIL ASSEMBLY
NOTE: OBSOLETE CURRENT TRANSFORMERS USED w/600572 UNLESS OTHERWISE SPECIFIED.

12. When Optional Circuit Isolation Device is required, list P/N and size of Circuit Isolation Device, and note appropriate cabinet A/N.
13. To convert the Control Panel from side mounted cabinet control to door mounted or door mounted cabinet control to side mounted.
    Remove Cover Plate and Control Panel Dial Plate Assembly. Position spiral wrap around all harness wiring to prevent interference of wiring with the closing of cabinet door.
    When mounting Control Panel on side of cabinet, use clamp to secure J3 harness wires.
    CAUTION: When changing the position of the Control Panel, be sure harness wires do NOT interfere with the closing of the cabinet door. Wires may pinch in between door & cabinet and cause damage to wiring.
14. DIP Switch settings for positions 1 thru 4 on RS485 Driver Board (PCB5) are set at the factory to default as a last location RS485 in an interconnect wiring arrangement. See DIP Switch Settings Chart to change the settings when this RS485 is used as a middle location. J485-J485 Cable Assembly can be used to connect interconnect to either an RT4 Control, another ENTRON Welding Control, or a NON-ENTRON device that has a RS485 Interface Board. See Wiring Diagram #421407 for Interconnect Wiring of RS485 Driver Boards.

PLUMBING DIAGRAMS
SEE PARTS LIST FOR HOSE LENGTH



CAUTION
WATER HOSE BURST HAZARD
Cooling water must be flowing when power is on.
Water hose can burst and damage controls.

ENTRON RS485 DRIVER BOARD DIP SWITCH SETTINGS CHART

		LOCATION OF EACH ENTRON RS485 DRIVER BOARD IN AN INTERCONNECT ARRANGEMENT: FIRST RS485 IN INTERCONNECT ARRANGEMENT (Qty. One of RS485)	MIDDLE RS485 IN INTERCONNECT ARRANGEMENT (Qty. Of RS485 may vary)	LAST RS485 IN INTERCONNECT ARRANGEMENT (Qty. One of RS485)
DIP SWITCH POSITION	POSITION 4	ON	OFF	ON
DIP SWITCH POSITION	POSITION 3	ON	OFF	OFF
FOR ON/OFF SETTING	POSITION 2	OFF	OFF	ON
DIP SWITCH SETTING	POSITION 1	OFF	OFF	ON

PARTS LIST - CONTROL SECTION — 421269-014 B

QTY.	DESIG.	PART NO.	DESCRIPTION
1		600574-004	Assem., Dial Plate, w/Sw. Assem., EN1001, Consisting of:
0		600574-005	Assem., Dial Plate, w/Sw. Assem. & Keylock, EN1001, Consisting of:
1	PCB1	600572-002	Assem., Switch, Sequence Control & Display Board
0	SW1	600531-001	Assem., Switch, Keylock, Momentary, SPST
1		540245	Illustrated Panel, Dial Plate, EN1001
1		515104	Panel, Display Window, Red Filter, EN1001
1		565003	Hole Plug, 3/4" Diam., Black
1	PWR.LT.	305001	Lamp, Neon, Red, 230V
1	WLD.LT.	305002	Lamp, Neon, Clear, 230V
1	J2-J2	322326	Assem., Harness, Sequence Ctrl Bd. to Terminal Strip Bd.
1	J3	322325	Assem., Harness, Power, EN1000/EN1001
1	J4-J4	322397	Assem., Harness, Sequence Control Bd. to RS485 Driver Bd.
1	J485-J485-J485	322369-011	Assem., Harness, RS485 Driver Board to Cabinet connector

PARTS LIST - CONTACTOR SECTION

EN1001-2200	EN1001-1800	EN1001-1200	EN1001-600	EN1001-300	DESIG.	PART NO.	DESCRIPTION
1	1	1	1	1	TS1	335034	Terminal Strip, 10 Pin, (Part of J3 Harness)
#	#	#	#	#	TS7	335044	Terminal Strip, 2 Pin
+	+	+	+	+	TS8	335017	Terminal Strip, 2 Pin, (Part of 1800/2200A Cont. Assem's.)
1	1	1	1	1	T1	310001	Transformer, Control, (Part of J3 Harness)
1	1	1	1	1	T2	310002	Transformer, Sense, (Part of J3 Harness)
1	1	1	1	1	T3	311002	Transformer, Valve, 150VA
*	*	*	*	*	T3	311017	Transformer, Valve, 150VA, 575V
1	1	1	1	1	T3	311022	Transformer, Valve, 250VA
2	2	2	2	2	R70,71	225016	Resistor, Power, Surge, 500 Ohm, 100W
~	~	~	~	~	R74	600048	Assem., Resistor, Power, 2000 Ohm, 10W, (For 575V)
1	1	1	1	1	R81	210198	Resistor,Metal Oxide, .1 Ohm,1W,(Part of Current Xfmr Assem.)
1	1	1	1	1	F1	308010	Fuseholder, 1 Pole, Mini, 600V
1	1	1	1	1	F1	307024	Fuse, Control, 1/4A, FNQ-R-1/4 or KLDR-1/4
3	3	3	3	3	F6,7,8(PCB2)	307022	Fuse, 1 Amp, Slow Blow, 2AG, (Part of 410319)
1	1	1	1	1	(R70,71)	325024	Assem., Wire, Surge Resistor, 18 Ga., Black
2	2	2	2	2	(T3)	325149	Assem., Wire, Valve Transformer, 22 Ga., Black
			1			600520	Assem., Contactor, Thyristor. Air. 300A, 460/575V. w/TLS
		1				600610	Assem., Contactor, Thyristor. Air. 300A, 460/575V. w/TLS
	1					600598	Assem., Contactor, Thyristor. Air. 300A, 460/575V. w/TLS
				1		600533-005	Assem., Contactor, SCR. Water. 1800A. 460/575V. w/TLS
				1		600533-003	Assem., Contactor, SCR. Water. 2200A, 460/575V. w/TLS
		1	1			341040	Standoff. Insulator, 6C3/1200A Thyristor Contactor. L1
		1	1			325174	Assem., Wire, Contactor-L1 to Lug-L1. 600/1200A Thyristor Cont.
		1	1			346004	Lug, Screw, 5/16" Bolt to 2/0 Wire, 600A Thyristor Contactor.H1
		1	1			346011	Lug, Screw, 1/4" Bolt to 2/0 Wire. 600A Thyristor Contactor. L1
		2				346002	Lug, Screw.5/16" Bolt to 250 MCM (4/0) Wire,1200A Cont..L1 & H1
←	←	←	←	←	SEE CHART	SEE CHART	Assem., Transformer, Current, 200:5, P2
←	←	←	←	←	SEE CHART	SEE CHART	Assem., Transformer, Current, 500:5, P5
←	←	←	←	←	SEE CHART	SEE CHART	Assem., Transformer, Current, 1000:5, P10
Ⓑ ←	←	←	←	←	SEE CHART	600667	Secondary Current, 6" Coil Rogowski
Ⓑ ←	←	←	←	←	SEE CHART	600668	Secondary Current, 10" Coil Rogowski
Ⓑ ←	←	←	←	←	SEE CHART	322475	Assem., Harness, Secondary Current, Rogowski Coil
1	1	1	1	1		346004	Lug, Screw, Chassis GND, 2/0 Wire
1	1	1	1	1	PCB2	410319	Assem., PCB, Terminal Strip Board, EN1000/EN1001
1	1	1	1	1	(PCB2)	510236	Plate, Mounting, Terminal Strip Board
			1			525035	Bracket, Mounting, 300A Thyristor Contactor
1	1					525136	Bracket, Mounting, 1800/2200A Contactors
		1	1			530021	Plate, Mounting, 600/1200A Contactors
1	1	1	1	1	TLS	300020	Switch, Temperature Limit, (N.C.), (Part of 300A Contactor & 1800/2200A Contactor Assem.'s)
Ⓐ						525035	BRACKET,MOUNTING, RS485 DRIVER BOARD
X	X	X	X			900045	Hose, 3/8" I.D.
4	4	4	4			566010	Hose Clamp, 3/8" Hose
2	2	2	2			600179	Assem., Water Fitting, 3/8" Hose
*	*	*	*		WFS	600297	Assem., Water Flow Switch, 3/8" Hose
←	←	←	←		SEE CHART	600590	Assem., Secondary Current Sensor (S)
←	←	←	←		SEE CHART	322379	Assem., Harness, Secondary Current Sensor
1	1	1	1			550014	Vault Closing Door Mechanism, "D/T/LS/LF" Cabinet
1	1	1	1			510247	Cabinet, Control, Style "D/T", w/CB
			1			510248	Door, Cabinet, Control, Style "D/T"
						510247-005	Cabinet, Control, Style "D/T", w/CB, Modified for 300A Cont.
						510257	Cabinet, Control, Style "LS/LF", w/CB
						510258	Door, Cabinet, Control, Style "LS/LF"
Ⓐ					C/B		Circuit Breaker, Pole, Amp, V, (See Note 12)
Ⓐ △					▼ J485-J485	900258	Cable Wire, 4 Conductor, 24 Ga., w/Shield
Ⓐ △					▼ J485-J485	331136	Connector, 9 Pin, Screw Terminal, "D" Style
Ⓐ					PCB5	410347	Assem., PCB, RS485 Driver Board
1	1	1	1	1		421407	Wiring Diagram, Interconnect Wiring of RS485 Driver Boards
1	1	1	1	1		700173	Application Note, Customer Assembled J485-J485 Cable Assembly
1	1	1	1	1		700171	Application Note, RS485 Driver Board
1	1	1	1	1		700120	Manual, EN1001
1	1	1	1	1		421271	Logic Diagram, EN1001 Control
1	1	1	1	1		421269-014	Wiring Diagram, EN1001-Series/485, "D/T/LS/LF" Cabinet

⊠ Optional.
△ Optional, See Note 12.
▼ Customer to assemble J485-J485 Cable Assembly per Application Note 700173. ENTRON to supply 25 feet (25') of Cable P/N 900258, two (2) Connectors P/N 331136, two (2) "J485" Labels P/N 460228 one (1) for each Connector (SHIPPED LOOSE).
@ Optional Keylock when specified by customer. See Note 8. Pack Key in Poly Bag 900148 & attach to Door w/Yellow Tape 900118.
* Substitution or addition of parts when 575V control is specified.
# Supplied when optional Shunt Trip (ST), 115V is specified.
~ Optional Water Flow Switch Assembly & TS8. An additional Thirty-Six inches (36") of hose, P/N 900045 and two (2) hose clamps, P/N 566010 are to be supplied. See Note 9.
X For all contactors in "D/T" cabinet supply 39" of hose. For all contactors in "LS/LF" cabinet supply 60" of hose.

MANUFACTURING INSTRUCTIONS:
See Drawings #440365, #515112, #515114, & #600552 for Mechanical Assembly Instructions of EN1001 "LS/LF" Cabinet.
See Drawing #440190-001 for Mechanical Layout of "LS/LF" Cabinet Rear Panel.
See Drawing #440093 for Crating Instructions of "LS/LF" Cabinet.
See Drawing #600562 for Mechanical Layout/Assem. of EN1001 "D/T" Cabinet.
See Drawing #440366 for Inner Pack & use Carton #650016 for "D/T" Cabinet Packing Instructions.
See Drawing #440437 for Circuit Breaker to L1 Contactor Cable connections.
See Drawing #600526 for Layout/Assem. of Front Panel.
See Drawing #440457 for Current Transformer Assembly.
See Drawing #440458 for Secondary Current Sensor Assembly.
See Drawing #440478 for Secondary Current Coil Assembly.

REV.	AUTH.	DESCRIPTION	DRAWN BY DATE	CHK'D BY DATE
B		IN DRWG ON PCB5:CHG'D SETTING SELECTIONS FOR SWITCH POSITIONS 1 & 2 IN SETTINGS CHART:CHG'D DIP SWITCH POSITIONS. FIRST LOCATION POSITION 1:"OFF" WAS "ON". POSITION 2 "ON" WAS "OFF". POSITION 3 "ON" WAS "OFF". LAST LOCATION POSITION 1:"ON" WAS "OFF". POSITION 2 "ON" WAS "OFF". & POSITION 3 "OFF" TO "ON"	DEC	DEC
ECN 2691		ADDED TS1-L2/CTH4 & P/L:ADDED R81 RESISTOR, 210198 & KLDR-1/4 307018 BBS 6/10A: IN DRWG:ADDED REF NOTE :PRIOR TO 10-1-00:		
ECN 2631		FOR 300A,600A,1200A,1800A, & 2200A XTORS IN P/L: ADDED S6 600667 S10 600668, & J12-J12 HARNESS 322475:IN DRWG:ADDED VIEW "D" & SHOWN CONNECTIONS TO J12:UPDATED NOTE 11:CHG'D SECONDARY CONNECTIONS TO SECONDARY CURRENT COIL (S6 & S10) CHART: IN ALL XTOR W/O S:UPDATED REF NOTE :SEE NOTE 11 & VIEWS B, C, & D: IN VIEWS "B" & "C":ADDED SYSTEM SHORT JUMPER:ON PCB1:ADDED SYSTEM SHORT JUMPER: IN DRWG BELOW P/L:ADDED REF NOTE :SEE DRWG	6-14-02	6-14-02
ECN 2617		600552:CHG'D SECONDARY CURRENT SENSOR (S) WIRE COLORS:IN VIEW "C":CHG'D SEC.CURR.SENSOR (S) WIRE COLORS & ADDED NOTE 9:PRIOR TO NOVEMBER,1999.::		
ECN 2588				
A	ECN 2569	FOR 300A,600A,1200A,1800A, & 2200A XTORS IN P/L:: CABLE 900258 & CONNECTOR 331136 REPLACED J485-J485 CABLE ASSEM.& J485-J485 CONN. & 326043,326043-002 APP NOTE 700173 & OPTIONAL HOW STD.& ADDED BRKT 525035:IN DRWG:ADDED J485-J485 CABLE ASSEM.& J485-J485 CONN. AS STD W/326043,003 & 326043-002 OPTIONAL.:: & UPDATED REF NOTE "CUSTOMER ASSEMBLED J485-J485 CABLE ASSEMBLY.":IN DRWG NEXT TO PCB5:ADDED NOTE "CUSTOMER ASSEMBLED J485-J485.:: WAS REF NOTE "326043, 326043-003, & 326043-002.:.":	DEC	DEC
			11-18 99	11-18 99

REV.	AUTH.	DESCRIPTION	DRAWN BY DATE	CHK'D BY DATE
—	—	ORIGINAL RELEASE		

ENTRON CONTROLS INC.

SCALE	DATE	DRAWN BY	CHK'D BY	APPROVED BY
NL	10-18 99	DEC	DEC 10-18-99	

TOLERANCE UNLESS SPECIFIED — REVISED
ANGLES: ± 1/2° — REV LTR — APPROVED BY
DECIMALS: ± .010 — B
FRACTIONS: ± 1/64 — DATE 6-14-02 DEC

WIRING DIAGRAM, EN1001-SERIES/485, "D", "T", "LS", or "LF" CABINET

EN1001-300D,T,LS,LF/485 EN1001-600D,T,LS,LF/485 EN1001-1200D,T,LS,LF/485 EN1001-1800D,T,LS,LF/485 EN1001-2200D,T,LS,LF/485

NEXT ASSM/USED ON | DRAWING NUMBER 421269-014 | REV B

421269-014 B

22x34 ENTRON 470046