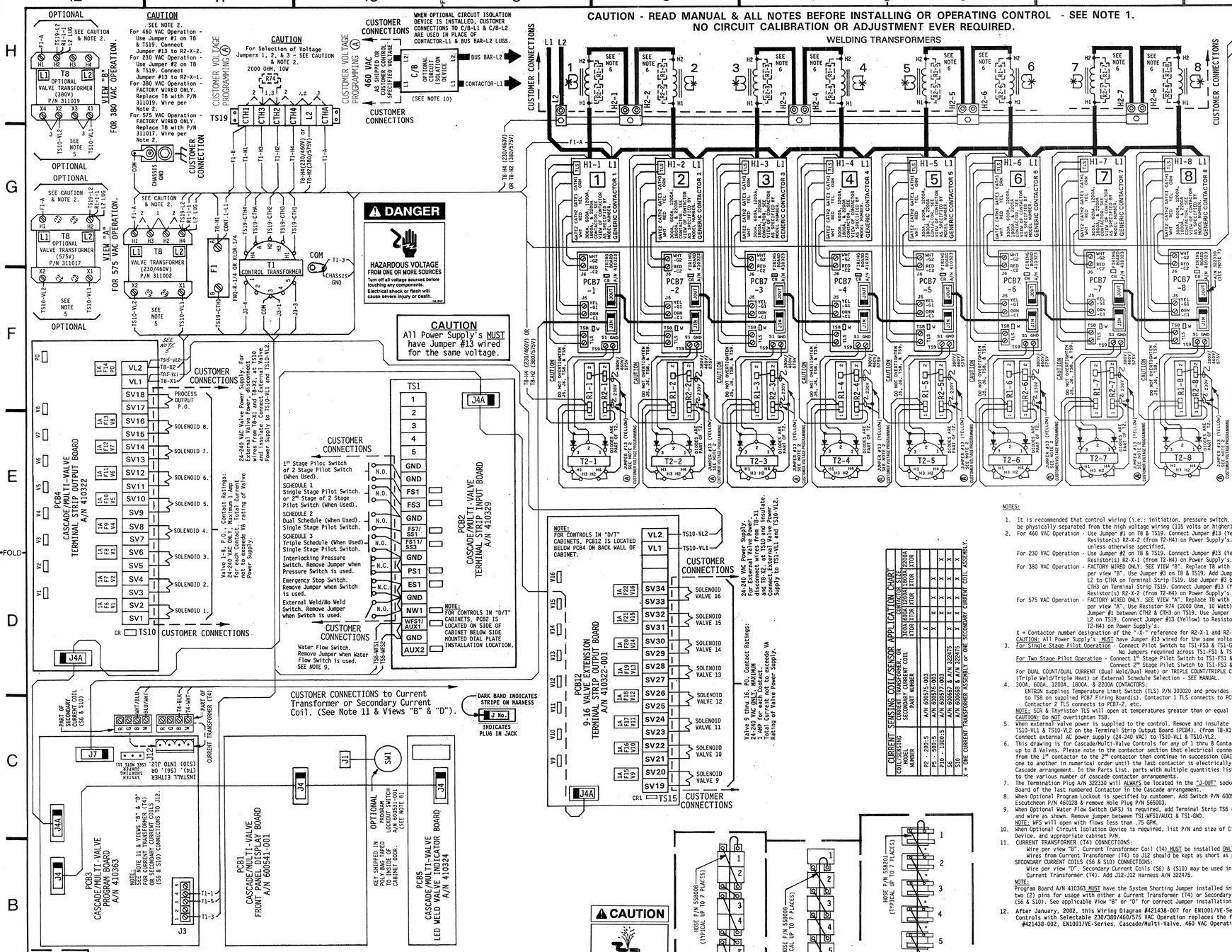


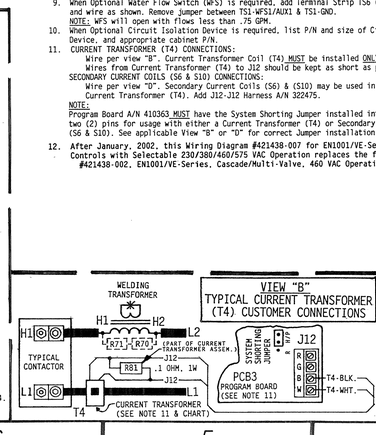
NOTES:

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 T8 & TS19. Connect Jumper #13 (Yellow) to Resistor(s) R2-X-2 (from T2-H4) on Power Supply's. As shipped unless otherwise specified.
   For 230 VAC Operation - Use Jumper #2 on T8 & TS19. Connect Jumper #13 (Yellow) to Resistor(s) R2-X-1 (from T2-H4) on Power Supply's.
   For 380 VAC Operation - FACTORY WIRED ONLY. SEE VIEW "B". Replace T8 with P/N 311019. Wire per view "B". Use Jumper #3 on T8 & TS19. Add Jumper #3 between L2 to CTH4 on Terminal Strip TS19. Use Jumper #3 between CTH2 & CTH3 on Terminal Strip TS19. Connect Jumper #13 (Yellow) to Resistor(s) R2-X-2 (from T2-H4) on Power Supply's.
   For 575 VAC Operation - FACTORY WIRED ONLY. SEE VIEW "A". Replace T8 with P/N 311017. Wire per view "A". Use Resistor R74 (2000 Ohm, 10 Watt) in place of Jumper #1 between CTH2 & CTH3 on TS19. Use Jumper #1 between CTH4 & L2 on TS19. Connect Jumper #13 (Yellow) to Resistor(s) R2-X-2 (from T2-H4) on Power Supply's.
   X = Contactor number designation of the "-X-" reference for R2-X-1 and R2-X-2.
   CAUTION: All Power Supply's MUST have Jumper #13 wired for the same voltage.
   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. 300A, 600A, 1200A, 1800A, & 2200A CONTACTORS:
   ENTRON supplies Temperature Limit Switch (TLS) P/N 300020 and provides connections to TS8 on supplied PCB7 Firing Board(s). Contactor 1 TLS connects to PCB7-1.
   Contactor 2 TLS connects to PCB7-2, etc.
   NOTE: SCR & Thyristor TLS will open at temperatures greater than or equal to 150 F.
   CAUTION: Do NOT overtighten TS8.
5. When external valve power is supplied to the control. Remove and insulate leads TS10-VL1 & TS10-VL2 on the Terminal Strip Output Board (PCB4). (from T8-X1 & T8-X2). Connect external AC power supply (24-240 VAC) to TS10-VL1 & TS10-VL2.
6. This drawing is for Cascade/Multi-Valve Controls for any of 1 thru 8 Contactors and up to 8 Valves. Please note in the contactor section that electrical connections connect from the 1st contactor to the 2nd contactor then continue in succession (DAISY CHAIN) from one to another in numerical order until the last contactor is electrically connected in the Cascade arrangement. In the Parts List, parts with multiple quantities listed, correspond to the various number of cascade contactor arrangements.
7. The Termination Plug A/N 322330 will ALWAYS be located in the "J-OUT" socket on the Firing Board of the last numbered Contactor in the Cascade arrangement.
8. When Optional Program Lockout is specified by customer. Add Switch P/N 600531-001 and Escutcheon P/N 460128 & remove Hole Plug P/N 565003.
9. When Optional Water Flow Switch (WFS) is required, add Terminal Strip TS6 (P/N 335017) and wire as shown. Remove Jumper between TS1-WFS1/AUX1 & TS1-GND.
   NOTE: WFS will open with flows less than .75 GPM.
10. When Optional Circuit Isolation Device is required, list P/N and size of Circuit Isolation Device, and appropriate cabinet P/N.
11. CURRENT TRANSFORMER (T4) CONNECTIONS:
    Wire per view "B". Current Transformer Coil (T4) MUST be installed ONLY on L1.
    Wires from Current Transformer (T4) to J12 should be kept as short as possible.
    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:
    Program Board A/N 410363 MUST have the System Shorting Jumper installed into the correct two (2) pins for usage with either a Current Transformer (T4) or Secondary Current Coils (S6 & S10). See applicable View "B" or "D" for correct Jumper installation.
12. After January, 2002, this Wiring Diagram #421438-007 for EN1001/VE-Series, Cascade/Multi-Valve Controls with Selectable 230/380/460/575 VAC Operation replaces the following Wiring Diagram : #421438-002. EN1001/VE-Series, Cascade/Multi-Valve, 460 VAC Operation.

CURRENT SENSING COIL/SENSOR APPLICATION CHART										
COIL/SENSING MODEL NUMBER	CONTACTOR SIZE / CURRENT TRANSFORMER, OR SECONDARY CURRENT COIL PART NUMBER	300A CTOR	600A CTOR	1200A CTOR	1800A CTOR	2200A CTOR				
P2 - 200:5	A/N 600575-003	X	X	X	X	X				
P5 - 500:5	A/N 600576-003	X	X	X	X	X				
P10 - 1000:5	A/N 600577-003	X	X	X	X	X				
S6	A/N 600667 & A/N 322475	X	X	X	X	X				
S10	A/N 600668 & A/N 322475	X	X	X	X	X				

X = ONE CURRENT TRANSFORMER ASSEMBLY OR ONE SECONDARY CURRENT COIL ASSEMBLY.

CASCADE CABINET/HOSE SELECTION CHART												
NUMBER OF CONTACTORS	300A REAR PANEL	300A CAB. SIZE	600/1200A REAR PANEL	CAB. SIZE	600/1200A HOSE LENGTH	1800A CAB. SIZE	1800A REAR PANEL	1800A HOSE LENGTH	2200A REAR PANEL	2200A CAB. SIZE	2200A HOSE LENGTH
1	494221	D/T	494321	D/T	45"				494612	L	
2	494221	D/T	494321	D/T	36"	494522	L	47"	494633	H	
3	494242	L	494332	L	45"	494543	H	52"	494633	H	63"
4	494242	L	494343	H	60"	494543	H	70"	494644	G	
5	494262	L	494364	G	72"	494554	G	76"	494665	U	94"
6	494262	L	494364	G	68"	494575	U	76"	494665	U	90"
7	494283	H	494385	U	80"	494575	U	76"			
8	494283	H	494385	U	76"	494585	U	76"			



CAUTION
SEE NOTE 2.
Control Shipped is Wired for 460 VAC Operation unless otherwise specified.

SIDE MT'D DIAL PLATE	DOOR MT'D DIAL PLATE	DESIG.	PART NO.	DESCRIPTION
				PARTS LIST - CONTROL SECTION
QUANTITY				
1	1		600685	Assem., Dial Plate, EN1001 Cascade, Consisting of:
1	1	PCB1	600541-001	Assem., Switch, Front Panel Display Board
1	1		540298	Illustrated Panel, Dial Plate, EN1001 Cascade/Multi-Valve
2	2		515096	Display Window, Panel, Red Filter, Cont. & Valve, EN1001 Cascade
1	1		515104	Display Window, Panel, Red Filter, LED, EN1001 Cascade
1	1	PCB5	410324	Assem., PCB, Contactor Weld & Valve Indicator Board, EN1001 Casc.
1	1	PCB3	410363	Assem., PCB, Program Board, EN1001 Cascade/Multi-Valve
Ø	Ø	SW1	600531-001	Assem., Switch, Keylock, Momentary, SPST
1	1		565003	Hole Plug, 3/4" Diam., Black, (For Keylock Hole)
	1	J3	322340-004	Assem., Harness, Power, Door Mounted
1		J1	322341-004	Assem., Harness, Power, Side Mounted
1	1	J4-/J6-/J4	322342	Assem., Harness, Seq. Display Bd./Program Bd./LED Indicator Bd.
	*1	J4A-J4A-J4A -J4A	322449	Assem.,Harness,Program/Output/Input/Valve Extension,Door Mt'd.
*1		J4A-J4A-J4A -J4A	322436	Assem.,Harness,Program/Output/Input/Valve Extension,Side Mt'd.
1	1	TS10-TS15	322435	Assem., Harness, Term Output Bd. to Valve Extension Term Bd.
	*1	J7-IN	322346	Assem., Harness, Program Bd. to Firing Board, Door Mounted
*1		J7-IN	322347	Assem., Harness, Program Bd. to Firing Board, Side Mounted

EN1001-2200	EN1001-1800	EN1001-1200	EN1001-600	EN1001-300	DESIG.	PART NO.	DESCRIPTION
							PARTS LIST - CONTACTOR SECTION
QUANTITY							
+	+	+	+		TS6	335017	Terminal Strip, 2 Pin, 15A, (For WFS)
1	1	1	1	1	TS19	335024	Terminal Strip, 6 Pin, 20A
1	1	1	1	1	T1	310001	Transformer, Control, (Part of J3 Harness)
⊠	1	⊠	⊠	1	T8	311002	Transformer, Valve, 150VA, 230/460V
X	X	X	X	X	T8	311017	Transformer, Valve, 150VA, 575V
X	X	X	X	X	T8	311019	Transformer, Valve, 150VA, 380/408/415V
X	X	X	X	X	T8	311022	Transformer, Valve, 250VA
2	2	2	2	2	(T8)	325149	Assem., Wire, Valve Transformer, 22 Ga., Black
	1-3					341040	Insulator, Standoff, L2 Bus Bar
			2-10	1		346011	Lug, Screw, 1/4" Bolt to 2/0 Wire, L1, L2, H1, & 600A Contactor
			1-4	1-4		346015	Lug, Screw, 1/4" Bolt to Dual 2/0 Wire, L2 Bus Bar
		2-10				346002	Lug, Screw, 1/4" Bolt to 4/0 Wire, L1, L2, & H1
		1-4				346006	Lug, Screw, 1/4" Bolt to Dual 4/0 Wire, L2 Bus Bar
	2-12					346005	Lug, Screw, 1/4" Bolt to 350 MCM Wire, L1, L2, & H1
	1-10					346010	Lug, Screw, 1/4" Bolt to Dual 350 MCM Wire, L2 Bus Bar
3-14						346003	Lug, Screw, 1/4" Bolt to 500 MCM Wire, L1, L2, & H1
0-2						346016	Lug, Screw, 1/4" Bolt to Dual 500 MCM Wire, L2 Bus Bar
				#1-2		600520	Assem., Contactor, Air, 300A, w/TLS, 460/575V
				#2-7		600520-004	Assem., Contactor, Air, 300A, w/TLS, 460/575V, w/o L1 Lug
			1-8			600610	Assem., Contactor, Water, 600A, 460/575V
		1-8				600598	Assem., Contactor, Water, 1200A, 460/575V
	1-8					600549	Assem., Contactor, Water, 1800A, 460/575V
1-8						600535	Assem., Contactor, Water, 2200A, 460/575V
	1-8				TLS	300020	Switch, Temp. Limit, (N.C.). (Part of 600520 & 600520-004)
1-8	1-8					530021	Plate, Mounting, 1800/2200A Contactor
1-8	1-8					535136	Bracket, Mounting, 1800/2200A Contactor Plate
				1-8		525035-001	Bracket, Mounting, 300A Contactor
	1-8					600547-005	Assem., Power Supply, Selectable 230/380/460/575V, Consisting of:
	1-8				T2	600548-003	Transformer, Sense, (Part of 600547-005)
	2-16				R1.2	225016	Resistor, Power, Surge, 500 Ohm, 100W, (Part of 600547-005)
	1-8				(R1.2)	325024	Assem., Wire, Surge Resistor, 18 Ga., Black,(Part of 600547-005)
	1-8				PCB7-1 thru -8	410323	Assem., PCB, Firing Board, Cascade, (Mounted on Power Supply)
	*0-7				JIN-JOUT	322348	Assem., Harness, Firing Bd., Input to Output
1	1	1	1	1	JOUT	322330	Assem., Termination Plug, Cascade Firing Bd. (SEE NOTE 7)
⊠	⊠	⊠	⊠	⊠	R74	600048	Assem., Resistor, Power, 2000 Ohm, 10W, (For 575V)
1	1	1	1	1	F1	308010	Fuseholder, 1 Pole, Mini, 600V, HPC-L(BBS)
1	1	1	1	1	F1	307024	Fuse, Control, *1/4, FNQ-R-1/4 OR KLDR-1/4*
9	9	9	9	9	F6-14	307022	Fuse, 1 Amp, Slow Blow, 2AG, (Part of 410322)
1	1	1	1	1	PCB12	410322-001	Assem., PCB, 9-16 Valve Extension Terminal Strip Output Bd.
1	1	1	1	1		346004	Lug, Screw, Chassis GND, 5/16" Bolt to 2/0 Wire
1	1	1	1	1	PCB2	410329	Assem., PCB, Terminal Strip Input Bd., Cascade
1	1	1	1	1	PCB4	410322	Assem., PCB, Terminal Strip Output Bd., Cascade
2	2	2	2	2		510236	Plate Mounting, Terminal Strip Input & Output Boards
	SEE T4/S6/S10 CHART				T4	SEE CHART	Assem., Transformer, Current, 200:5, P2
	SEE T4/S6/S10 CHART				T4	SEE CHART	Assem., Transformer, Current, 500:5, P5
	SEE T4/S6/S10 CHART				T4	SEE CHART	Assem., Transformer, Current, 1000:5, P10
	SEE T4/S6/S10 CHART				S6	600667	Assem., Secondary Current, 6" Coil Rogowski
	SEE T4/S6/S10 CHART				S10	600668	Assem., Secondary Current, 10" Coil Rogowski
	SEE T4/S6/S10 CHART				J12-J12	322475	Assem., Harness, Secondary Current, Rogowski Coil
SEE CAB/HOSE SELECT CHART						900045	Hose, 3/8" I.D.
	0-7	0-7	0-7			558008	Hose, 3/8" I.D. x 12" Long
0-7	0-7					558201	Hose, 3/8" I.D. x 2 3/8" Dia. Coil x 18" Long
	4-18					556010	Hose Clamp, 3/8" Hose
2	2	2	2			600179	Assem., Water Fitting, 3/8" Hose
+	+	+	+		WFS	600297-004	Assem., Water Flow Switch, 3/8" Hose
△	△	△	△	△	C/B		Circuit Breaker, Pole, Amp, V. (SEE NOTE 10)
		SEE CASCADE CABINET/HOSE SELECTION CHART				510247	Cabinet, Control, Style "D/T", w/Circuit Breaker
						510257	Cabinet, Control, Style "LS/LF", w/Circuit Breaker
						510053	Cabinet, Control, Style "HS/HF", w/Circuit Breaker
						510055	Cabinet, Control, Style "SS/GF", w/Circuit Breaker
						510114	Cabinet, Control, Style "US/UF", w/Circuit Breaker
1	1	1	1	1		700146	Application Note, 9-16 Valve Output Circuits
1	1	1	1	1		700194	*MANUAL, ENTRON CASCADE*
1	1	1	1	1		421451	Logic Diagram, EN1001 Cascade
1	1	1	1	1		421438-007	Wiring Diagram, EN1001/VE-Series, Cascade/Multi-Valve

Ø Optional Keylock when specified by customer. See Note 8. Pack key in poly bag P/N 900148 & attach to door w/yellow tape P/N 900118.
△ Optional. See Note 10.
X Optional.
⊠ Substitution or addition of part when 575V control is specified.
\+ Optional Water Flow Switch Assembly (WFS). An additional Thirty-Six inches (36") of hose, P/N 900045 (as specified), and two (2) hose clamps, P/N 566010 are to be supplied. Add TS6 P/N 335017. See Note 9.
# For 1 & 2 Cascade controls with 300A Contactor(s). use Contactor P/N 600520.
For 3 thru 8 Cascade controls with 300A Contactors. use 600520 for Contactor number 1 & use 600520-004 for Contactor Numbers 2 thru 8.
* For 1 or 2 Cascade control in "T" Cabinet substitute J7-IN Harness 322346-001 for 322346.
For 1 or 2 Cascade control in "D" Cabinet substitute J7-IN Harness 322347-001 for 322347.
For 2 Cascade control in "D" or "T" Cabinet substitute JIN-JOUT Harness 322348-001 for 322348.
For 1 or 2 Cascade control in "T" Cabinet substitute J4A-J4A-J4A Harness 322359-001 for 322449.
For 1 or 2 Cascade control in "D" Cabinet substitute J4A-J4A-J4A-J4A Harness 322357-001 for 322436.

MANUFACTURING INSTRUCTIONS:
SEE DRAWINGS #440024, #515055, & #510095 FOR MECHANICAL ASSEMBLY INSTRUCTIONS.
See Drawing #440093 for Crating Instructions.
See Drawing #440428 for Label Locations.
See Drawing #440457 for Current Transformer Assembly.
See Drawing #440478 for Secondary Current Coil Assembly.

REV	AUTH	DESCRIPTION	DRWN BY DATE	CHK'D BY DATE
A	ECN 2753	ON TS19, RMV'D. "CUSTOMER CONNECTIONS" REPLACED WITH "CUSTOMER VOLTAGE PROGRAMMING". ALSO ADDED "CUSTOMER VOLTAGE PROGRAMMING AT R2 REGIS. ON EACH POWER SUPPLY.		12/11/02 RHL
—	—	ORIGINAL RELEASE		

ENTRON CONTROLS INC

SCALE	DATE	DRAWN BY	CHK'D BY	APPROVED BY
	5-21-02		DEC 5-21-02	

TOLERANCE UNLESS SPECIFIED
ANGLES: ± ½°
DECIMALS: ± .010
FRACTIONS: ± 1/64

REVISED
REV LTR A
DATE 12/12/02 RHL
APPROVED BY

WIRING DIAGRAM, EN1001/VE-SERIES, CASCADE/MULTI-VLV CONTROL, 1-8 CONTACTORS/8 VALVE OUTPUT CIRCUITS, WIRED FOR SELECTABLE 230/380/460/575 VAC OPERATION

NEXT ASSM/USED ON | DRAWING NUMBER 421438-007 | REV A

421438-007 A