

For detailed instructions see Controller Product Manual 51-52-25-135 or Limit Product Manual 51-52-25-136.

Step 1. Record Instrument Model & Serial

Note: Check inside label on chassis (remove from case)

Model number: _____

Serial number: _____

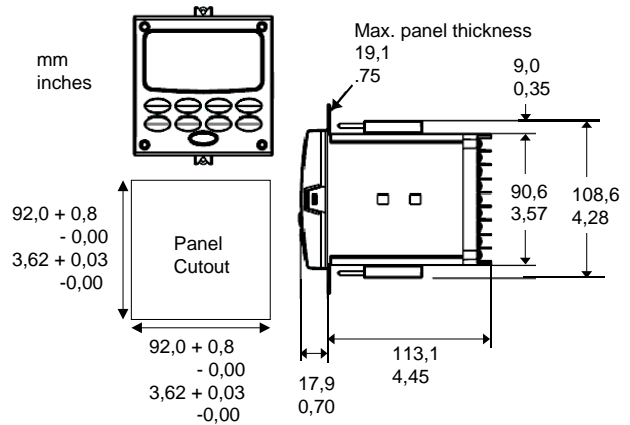
ETL25: Limit Control, listed for safety interlock, single relay output

ETC25: Universal Control with outputs for 4-20mA current or relay or 3-position step (floating), 2 alarms, and digital input

ETC25A: Advanced Program with 4-20mA current and 2 alarms, or relay output and 1 alarm; auxiliary output and 1 digital input or no aux-out and 2 digital inputs; second input; set-point programming; and IR configuration port.

Step 2. Dimensions and mounting

Note: For NEMA 4 water protection, install the 4 screws and washers into the indentations at the corners of the front bezel.



Step 3. Wiring

Fig. 3-1: ETL25 Limit Control

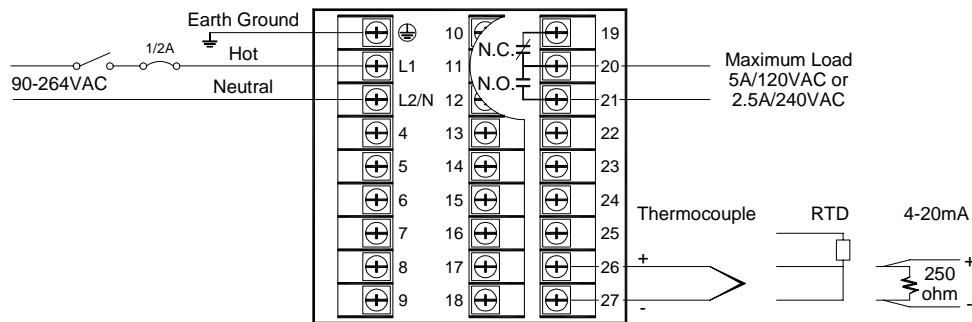


Fig. 3-2: ETC25 for 4-20mA current driven actuators

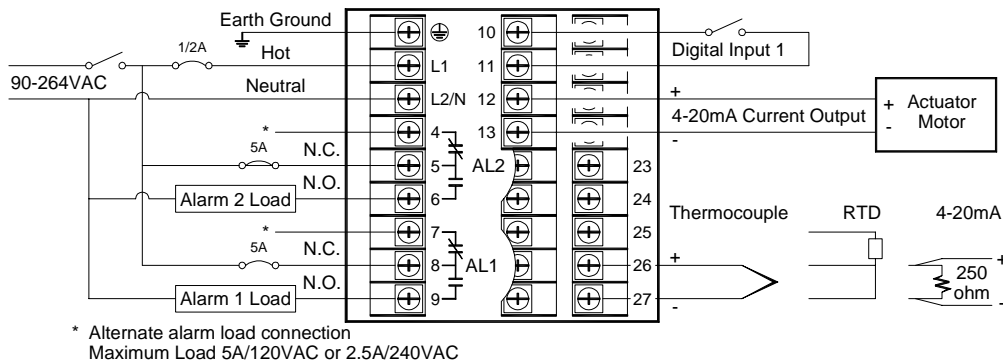


Fig. 3-3: ETC25 for High-Low or On-Off Control

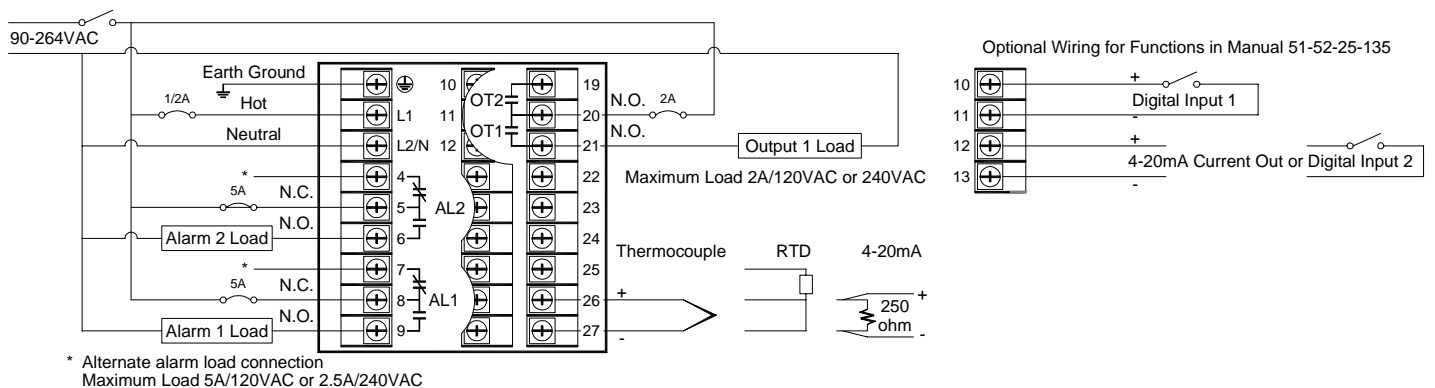


Fig. 3-4: ETC25 for Three Position Step Control of power-driven actuators

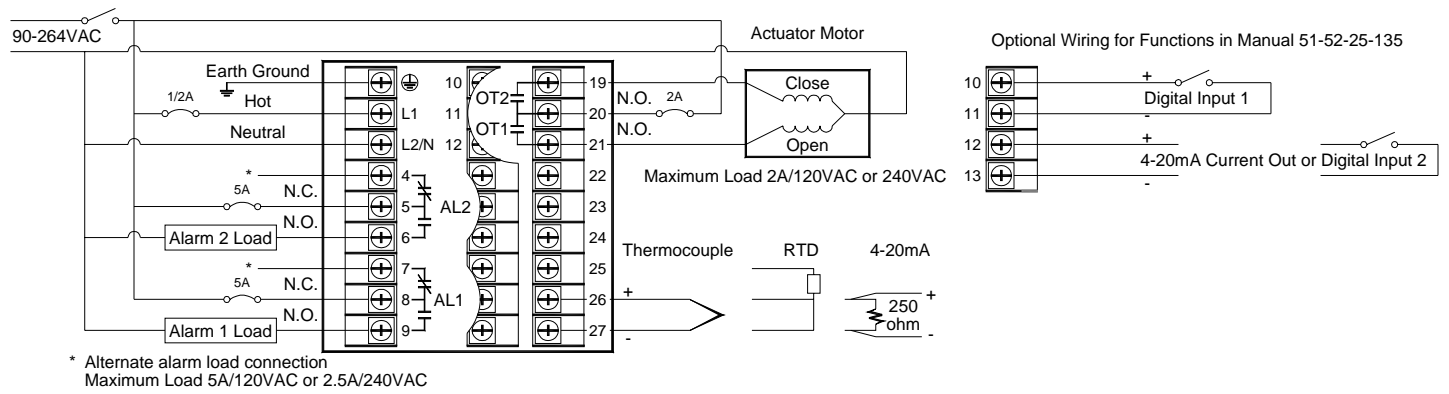


Fig. 3-5: ETC25 for Three Position Step Control of contact-driven actuators

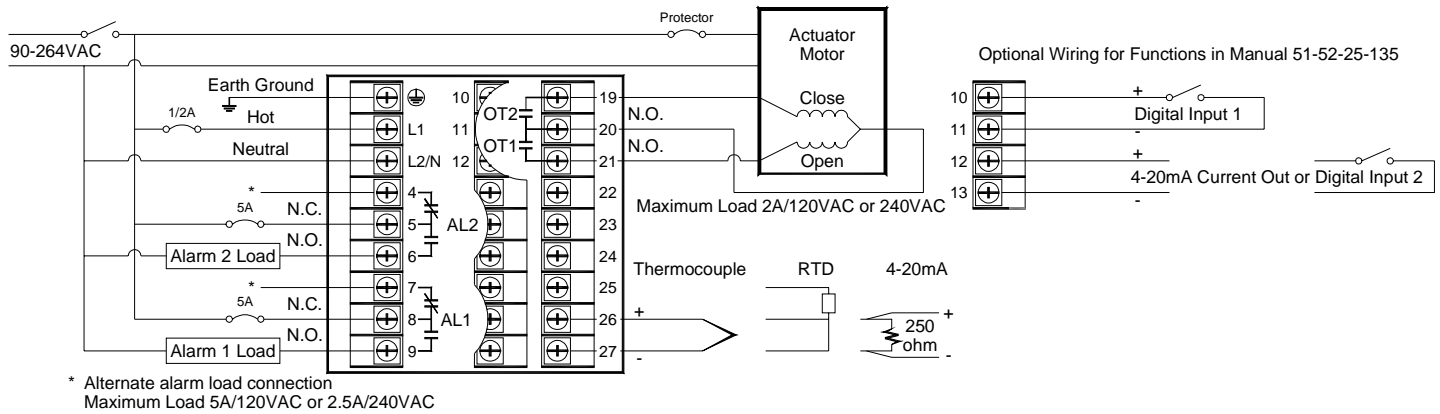


Fig. 3-6: ETC25A for 4-20mA current driven actuators includes Set-Point Programming, Remote Set-Point, and Heat-Cool capabilities.

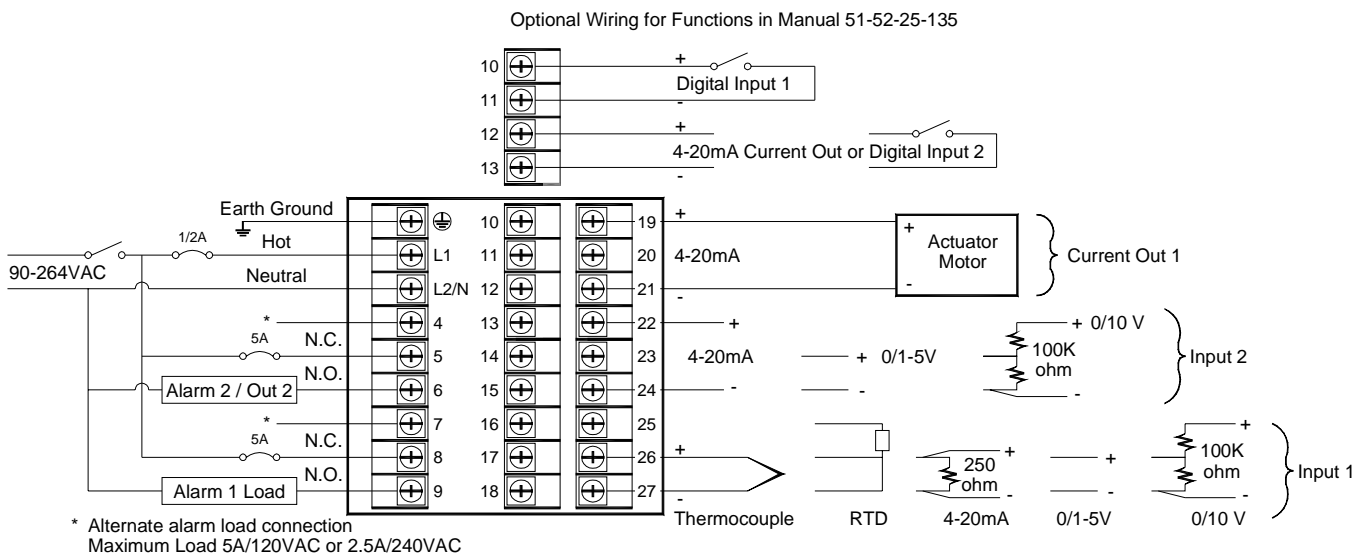
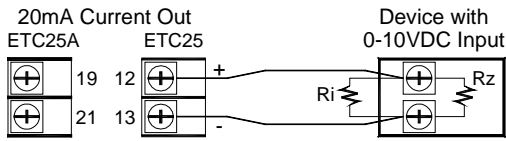


Fig. 3-7: ETC25 and ETC25A for 0-10VDC output.



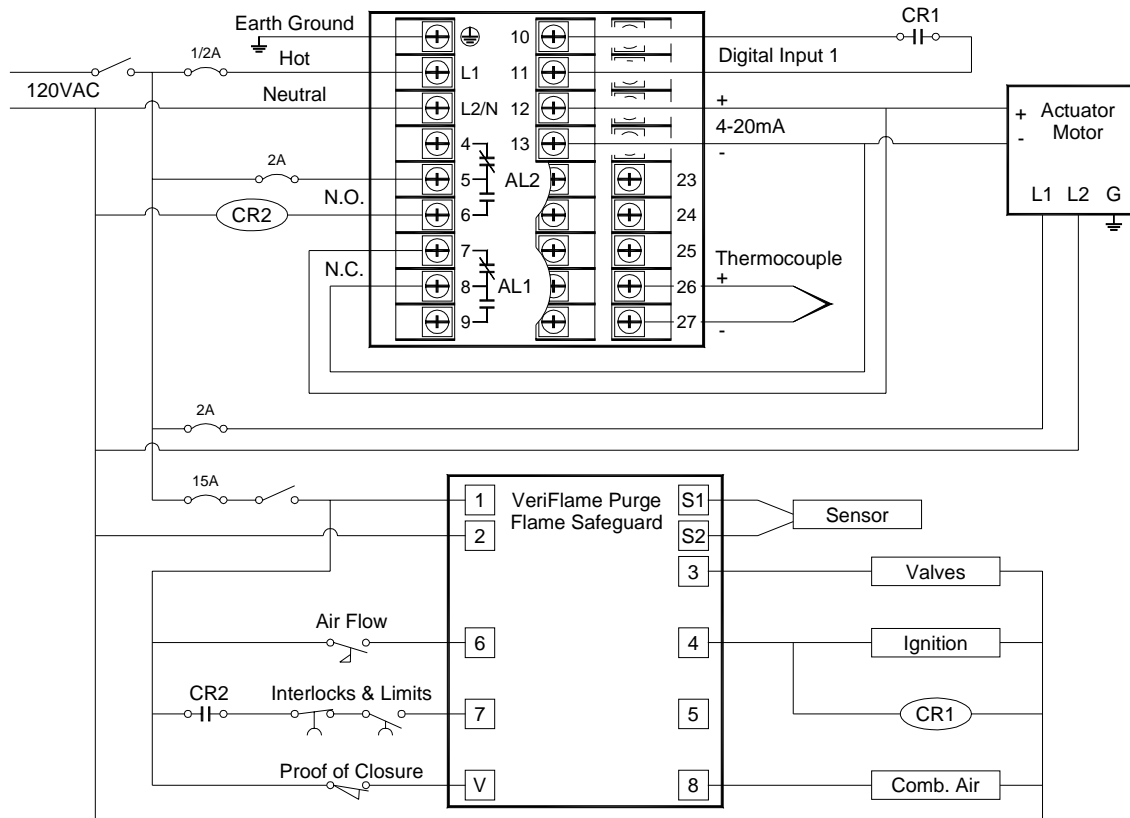
Ri is a resistor to be added to the input terminals of the device.
Rz is the input impedance of the device. It must be greater than 500 ohms.

- Set OUTALG – CRANGE to 0-20mA to get 0V at 0%
- Measure or look up the input impedance of the driven device
- Calculate Ri resistor value from the formula: $R_i = (500 \times R_z) / (R_z - 500)$
- Choose a 1% resistor equal to or the next greater standard value for the calculated resistance and power rating of at least 1/4W.

Fig. 3-8: ETC25 wiring to VeriFlame and a 4-20mA actuator

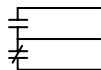
This circuit provides:

- a burner start position that is increased above the minimum firing rate,
- an alarm 1 setpoint to force the actuator to the minimum firing rate, and
- an alarm 2 setpoint to shut off the burner.



- In this example Alarm 1 is set for high deviation, A1S1TY = DE, A1S1HL = HIGH. When the temperature exceeds the setpoint by the value entered for A1S1VA, then the contact closes across the current output causing the actuator to move to the low fire position. It will be held at low fire until the difference between the temperature and setpoint drops below the A1S1VA setting.
- In this example Alarm 2 is also set for high deviation, A2S1TY = DE, A2S1HL = HIGH, except the value entered for A2S1VA is set greater than for alarm 1. If the application temperature keeps rising with the actuator at low fire, then the alarm 2 contact will open. This causes the CR2 contact to remove power from the interlock input of the flame safeguard and shut down the burner. When the difference between the temperature and setpoint falls within the A2S1VA setting, then power is restored to the flame safeguard interlock input and the burner is lit.
- Digital input 1 is used to force the output to a specific value for a burner starting position. It is useful for burners that require a higher firing rate to light reliably but can be turned down lower after lit. In the OPTION group, DIGIN1 is set to manual failsafe MNFS. The value for the starting position is entered in the CONTRL group under FAILSF as a percentage of output.

Fig 3-9 Alarm Relay Contact States



Alarm Relay Wiring	Variable NOT in Alarm State		Variable in Alarm State	
	Relay Contact	Indicators	Relay Contact	Indicators
N.O. - 5-6 or 8-9	Closed	Off	Open	On
N.C. - 4-5 or 7-8	Open		Closed	

Step 4. General Configuration Procedure

























Step	Operation	Press	Result
1	Enter Set Up Mode		<i>Upper Display = SET</i> <i>Lower Display = TUNING</i> (This is the first Set Up Group title)
2	Select any Set Up Group		Sequentially displays each Set Up Group Prompt, as listed below in the Configuration Record Sheet . You can also use the ▲ or ▼ keys to scan the Set Up groups in both directions. Stop at the group title that describes the group of parameters you want to configure. Then proceed to the next step.
3	Select a Function Parameter		<i>Upper Display</i> = the current value or selection for the first function prompt of the selected Set Up group. <i>Lower Display</i> = the first Function prompt within that Set Up group. Sequentially displays the other function prompts of the Set Up group you have selected. Stop at the function prompt that you want to change and then proceed to the next step.
4	Change the Value or Selection	▲ or ▼	Increments or decrements the value or selection that appears for the selected function prompt. If you change the value or selection of a parameter while in Set Up mode then decide not to enter it, press [M-A Reset] once—the original value or selection is recalled.
5	Enter the Value or Selection		Enters value or selection made into memory after another key is pressed.
6	Exit Configuration		Exits configuration mode and returns controller to the same state it was in immediately preceding entry into the Set Up mode. It stores any changes you have made. If you do not press any keys for 30 seconds, the controller times out and reverts to the mode and display used prior to entry into Set Up mode.

Table 4-1: ETC25 Steps to configure a 4-20mA Output Control [Do not use for ETC25A]

Step	Operation	Press	Result
1	Select ALGOR Group		<i>Upper Display = SET</i> ; press sequentially until <i>Lower Display = ALGOR</i>
2	Select CTRALG Function Parameter		<i>Upper Display</i> = displays present value to be changed <i>Lower Display = CTRALG</i>
3	Set to Proportional Control Mode	▲ or ▼	<i>Upper Display = PIDA</i> (also PIDB or PDMR) <i>Lower Display = CTRALG</i>
4	Select OUTALG Group		<i>Upper Display = SET</i> <i>Lower Display = OUTALG</i>
5	Select OUTALG Function		<i>Upper Display</i> = displays present value to be changed <i>Lower Display = OUTALG</i>
6	Set to Relay type	▲ or ▼	<i>Upper Display = RLY</i> <i>Lower Display = OUTALG</i>
7	Select OPTION Group		<i>Upper Display = SET</i> <i>Lower Display = OPTION</i>
8	Select AUXOUT Function Parameter		<i>Upper Display</i> = displays present value to be changed <i>Lower Display = AUXOUT</i>
9	Set to OUT	▲ or ▼	<i>Upper Display = OUT</i> <i>Lower Display = AUXOUT</i>
10	Verify 0 percent		<i>Upper Display = 0.0</i> <i>Lower Display = 0 PCT</i>
11	Verify 100 percent		<i>Upper Display = 100.0</i> <i>Lower Display = 100PCT</i>
12	Verify current starts at 4mA		<i>Upper Display = 4-20</i> <i>Lower Display = CRANGE</i>
13	Exit Configuration		Exits configuration mode and returns controller to the same state it was in immediately preceding entry into the Set Up mode.











NOTE: Although the ETC25 controller is used for current output, the OUTALG is set to RLY to match the physical hardware installed for output 1 and output 2 terminals. Therefore the RLYTYP must also remain set at MECH. The RLYTYP parameter is only viewed when LOCK is set to NONE.

Table 4-2: ETC25 Steps to configure ON-OFF or HIGH-LOW Output Control [for ETC25A use OUT2 per Fig.3-6]

Step	Operation	Press	Result
1	Select ALGOR Group		Upper Display = SET ; press sequentially until Lower Display = ALGOR
2	Select CTRALG Function Parameter		Upper Display = displays present value to be changed Lower Display = CTRALG
3	Set to On-Off Control Mode	 or 	Upper Display = ONOF Lower Display = CTRALG
4	Select OUTALG Group		Upper Display = SET Lower Display = OUTALG
5	Select OUTALG Function		Upper Display = displays present value to be changed Lower Display = OUTALG
6	Set to Relay type	 or 	Upper Display = RLY Lower Display = OUTALG
7	Exit Configuration		Exits configuration mode and returns controller to the same state it was in immediately preceding entry into the Set Up mode.

Note: The RLYTYP must remain set at MECH. The RLYTYP parameter is only viewed when LOCK is set to NONE.

Table 4-3: ETC25 Steps to configure Three-Position-Step Output Control

Step	Operation	Press	Result
1	Select ALGOR Group		Upper Display = SET ; press sequentially until Lower Display = ALGOR
2	Select CTRALG Function Parameter		Upper Display = displays present value to be changed Lower Display = CTRALG
3	Set to 3-Position Step Mode	 or 	Upper Display = TPSC Lower Display = CTRALG
4	Select OUTALG Group		Upper Display = SET Lower Display = OUTALG
5	Verify OUTALG Function		Upper Display = TPSC Lower Display = OUTALG
6	Select Motor Stroke Time Function Parameter		Upper Display = displays present value to be changed Lower Display = MTR TI
7	Set Actuator Motor Travel Time Value in Seconds	 or 	Upper Display = XX (enter time in seconds for 0 to 100% of stroke) Lower Display = MTR TI
8	Exit Configuration		Exits configuration mode and returns controller to the same state it was in immediately preceding entry into the Set Up mode.

NOTE: TPSC on the ETC25A uses the Alarm 1 (Output 3 terminals) and Alarm 2 (Output 4 terminals). The RLYTYP must remain set at MECH. The RLYTYP parameter is only viewed when LOCK is set to NONE.

Step 5. Configuration Record Sheet

Table 5-1: ETL25 Limit Control - Enter the value or selection for each prompt on this sheet so you will have a record of your controller settings.

Group Prompt	Function Prompt	Value or Selection	Factory Setting	Group Prompt	Function Prompt	Value or Selection	Factory Setting
LOCK	SECUR	_____	DIS	COM <i>Not Installed</i>	ComADR	_____	3
	LOCK	_____	CAL		ComSTA	_____	DIS
LIMIT	LOW-HIGH	_____	HIGH		IRENAB	_____	ENAB
	POWRUP	_____	NORM		SDENAB	_____	ENAB
	SP MAX	_____	2400		SHDTIM	_____	0
	SP MIN	_____	0		BAUD	_____	19200
	DISPLY	_____	PROC		TX DLY	_____	1
INPUT1	IN1TYP	_____	KH		WS FLT	_____	FP_B
	XMITR1	_____	LIN		UNITS	_____	PCT
	IN1 HI	_____	2400		LOOPBK	_____	DIS
	IN1 LO	_____	0	ALARMS <i>Relays Not Installed, Use for Visual Alarm Indication Only</i>	A1S1TY	_____	NONE
	BIAS 1	_____	0.0		A1S1VA	_____	90
	FILTR1	_____	1.0		A1S1HL	_____	HIGH
	BRNOUT	_____	UP		A1S2TY	_____	NONE
EMIS	_____	1.0	A1S2VA		_____	10	
OPTIONS <i>Not Installed</i>	AUXOUT	_____	DIS		A1S2HL	_____	HIGH
	0 PCT	_____	0		A2S1TY	_____	NONE
	100 PCT	_____	100	A2S1VA	_____	95	
	CRANGE	_____	4-20	A2S1HL	_____	HIGH	
	DIGIN1	_____	DIS	A2S2TY	_____	NONE	
DISPLY				A2S2VA	_____	5	
	DECML	_____		A2S2HL	_____	HIGH	
	UNITS	_____		ALHYST	_____	0.1	
				ALARM1	_____	NOL	
				BLOCK	_____	DIS	
				DIAGAL	_____	DIS	

Note: To prevent accidental changes to the set point, adjust SP MAX and SP MIN in the LIMIT group to the desired set point value.

Table 5-2: ETC25 & ETC25A Control - Enter the value or selection for each prompt on this sheet so you will have a record of your controller settings. Some prompts may not appear due to other prompt settings. Settings marked * are for the ETC25A.

Group Prompt	Function Prompt	Value or Selection	Factory Setting	Group Prompt	Function Prompt	Value or Selection	Factory Setting
TUNING	PB or GAIN	_____	10.00 (PB)	CONTRL	PIDSET	_____	ONE
	RATE T	_____	0.00		SW VAL	_____	0.00
	I MIN or I RPM	_____	1.20 (I RPM)		LSP'S	_____	ONE
	MANRST	_____	0.0		RSPSRC*	_____	NONE*
	PB2 or GAIN 2	_____	5.00		SP TRK	_____	NONE
	RATE2T	_____	0.20		PWR UP	_____	AMLS
	I2 MIN or I2 RPM	_____	1.30		PWROUT	_____	LAST
	CYCT1 or CT1X3	_____	10		SP Hi	_____	2400
	CYC2T2 or CT2X3	_____	10		SP Lo	_____	0
	SECUR	_____	0		ACTION	_____	REV
	LOCK	_____	CAL		OUT Hi	_____	100
	AUTOMA	_____	ENAB		OUT Lo	_____	0
	RN HLD	_____	ENAB		D BAND	_____	2.0
SP SEL	_____	ENAB	HYST	_____	0.5		
SPRAMP	SPRAMP	_____	DIS	OPTION	AUXOUT	_____	OUT
	T1 MIN	_____	3		0 PCT	_____	0
	FINLSP	_____	1000		100 PCT	_____	100
	SPRATE	_____	DIS		CRANGE	_____	4-20
	EUHRUP	_____	0		DIG IN 1	_____	NONE
	EUHRDN	_____	0		D1 CMB	_____	DIS
ATUNE	FUZZY	_____	DIS		DIG IN 2	_____	NONE
	TUNE	_____	TUNE		D12 CMB	_____	DIS
	DUPLEX	_____	MAN		COM <i>Not Installed</i> <i>Infrared Interface on ETC25A</i>	ComADR	_____
AT ERR	_____	---	ComSTA	_____		DIS	
ALGOR	CTRLG	_____	PIDA	IRENAB*		_____	ENAB*
	TIMER	_____	DIS	BAUD		_____	19.2K
	PERIOD	_____	0:01	TX_DLY		_____	1
	START	_____	KEY	WS_FLT		_____	FP_B
	L DISP	_____	TREM	SDENAB		_____	Enable
	RESET	_____	KEY	SHDTIM		_____	0
OUTALG	OUTALG	_____	RLY / CUR*	SDMODE		_____	Last
	CRANGE*	_____	4-20*	SHD_SP		_____	LSP
	RLY TYP	_____	MECH	UNITS		_____	PCT
INPUT1	MTRTI	_____	15	CSRATO		_____	1.0
	IN1TYP	_____	KH	CSP_BI		_____	0
	XMITR1	_____	LIN	LOOPBK	_____	DIS	
	IN1 HI	_____	2400	ALARMS	A1S1TY	_____	NONE
	IN1 LO	_____	0		A1S1VA	_____	90
	RATIO1	_____	1.00		A1S1HL	_____	HIGH
	BIAS 1	_____	0.0		A1S1EV	_____	BEGN
	FILTR1	_____	1.0		A1S2TY	_____	NONE
	BRNOUT	_____	UP		A1S2VA	_____	10
	EMIS	_____	1.0		A1S2HL	_____	HIGH
INPUT2 <i>ETC25A only</i>	IN2TYP	_____	1-5V*		A1S2EV	_____	BEGN
	LIN	_____	LIN*		A2S1TY	_____	NONE
	IN2 HI	_____	2400*		A2S1VA	_____	95
	IN2 LO	_____	0*	A2S1VA	_____	HIGH	
	RATIO2	_____	1.00*	A2S1HL	_____	HIGH	
	BIAS 2	_____	0.0*	A2S1EV	_____	BEGN	
	FILTR2	_____	1.0*	A2S2TY	_____	NONE	
					A2S2VA	_____	5
				A2S2HL	_____	HIGH	
				A2S2EV	_____	BEGN	
				ALHYST	_____	0.1	
				ALARM1	_____	NOL	
				BLOCK	_____	DIS	
				DIA AL	_____	DIS	
				DISPLY	DECMAL	_____	NONE
					UNITS	_____	F
					FREQ	_____	60
					NOLDSP	_____	DIS
			DISPLY	_____	SP		
			LNGUAG	_____	ENGL		

(*Ethernet Addresses accessible via the PIE tool)

Step 6. Start Up Procedure for Operation

Table 6-1: ETL25 Limit








Step	Operation	Press	Result
1	Display Setpoint		Press the "Lower Display" key till SP appears.
2	Enter the Limit Setpoint	▲ or ▼	Set the SP, using the Up & Down arrow keys, to the desired Limit Setpoint
3	Store the Limit Setpoint		Press the "Lower Display" to store the value.
4	If the display flashes "Limit"		Press the Auto-Man/ Reset key. For high limit, the temperature must be under the setpoint before it will reset.

Table 6-2: ETC25 & ETC25A

Step	Operation	Press	Result
1	Select Manual Mode		Until "M" indicator is ON. The controller is in manual mode.
2	Adjust the Output	▲ or ▼	To adjust the output value and test proper operation of the final control element. <i>Upper Display = Pv Value</i> <i>Lower Display = OT and the output value in %</i>
3	Enter the Local Setpoint		<i>Upper Display = Pv Value</i> <i>Lower Display = SP and the Local Setpoint Value</i>
		▲ or ▼	To adjust the local setpoint to the value at which you want the process variable maintained. The local setpoint cannot be changed if the Setpoint Ramp function is running.
4	Select Automatic Mode		Until "A" indicator is ON. The controller is in Automatic mode. The controller will automatically adjust the output to maintain the process variable at setpoint.
5	Tune the Controller		Use Accutune to tune the controller; see product manual for detailed procedure or refer to Tuning Set Up group to manually adjust PB or GAIN, RATE T, and I MIN or I RPM.

Supplemental Instructions for PV Hot Start for Setpoint Ramp and Setpoint Program (ETC25A)

When power is lost and resumed, the Setpoint Ramp or Setpoint Program will be placed in "HOLD". Using the RUN/HOLD key or a switch on the digital input, you can then remotely restart the ramp or program either at the current PV (PV Hot Start Enabled) or at the original starting setpoint of the SP Ramp or SP Program.

PV STRT can be configured to ENAB or DIS under the SP RAMP or SP PROGRAM Set Up groups. The rules for PV Hot Start (initializing the setpoint at the current PV on power up) are:

- Occurs only if PV Start is ENABLED in either SP RAMP or SP PROGRAM groups
- Occurs only following a power up
- Occurs only for Local Setpoint #1, and does not apply for Local Setpoint #2 or Remote Setpoint
- Applies in either Auto or Manual mode
- Following PV Hot Start, Local Setpoint #1 and Local Setpoint #2 can be changed via the increment/decrement keys

The Digital Input can be configured to RUN or STRT.

RUN – the program starts the setpoint at the current value of setpoint #1; reopening the contact returns to the HOLD state. If PV STRT is enabled, the value of setpoint #1 will be the value of the process variable PV following a power up.

STRT – the program starts the setpoint at the original value that was selected when the SP RAMP or SP PROGRAM was first started; reopening the contact has no effect.

- This action occurs either after a power cycling or after the SP PROGRAM has completed and the STATE at program end is configured for HOLD.
- The Digital Input must be selected for STRT before the SP RAMP or SP PROGRAM is put into RUN via the RUN/HOLD key in order to capture and save the original starting setpoint value.
- If the SP RAMP or SP PROGRAM is in the RUN state and then put in the HOLD state, contact closure will re-start the program at the setpoint value existing at the time when it was put into the HOLD state.
- Once in the RUN state, then this contact closure will have no effect.
- If this contact is held closed through the time that power cycles off and on, the action will occur in accordance with the rules above.



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