

Cimco 40XL-D-02

**Winding Temperature Indicator &
Controller for Dry-Type Transformers
U L RECOGNIZED COMPONENT**

Cimco Electronics, Inc.
P. O. BOX 248 • 104 MAIN ST.
West Mifflin, PA 16158
(412) 528-9559

Cimco's 40 XL-D-02 instruments provide winding temperature measurement, fan on-off control, alarm indication, trip indication, and trip and alarm switches for dry-type transformers. These instruments will also measure and remember the maximum temperature that is experienced by the transformer coil.

OPERATION

As the temperature of the transformer winding changes, the ambient compensated circuit provides accurate indication of the temperature which the thermocouple senses. This temperature is used to drive the control logic. The set points for the switch and light operation are energized from the same circuit which drives the indicator on the face of the panel. The alarm and trip relays have a 5°C hysteresis to maintain alarm and trip information. The fan control has approximately 25°C hysteresis to help extend the life of the fans and the fan relay contacts. An optional fan exerciser circuit automatically operate the fans once every 5-7 days for 6-7 minutes. The power light is green, the fans-on light is yellow, the alarm light is red, and the trip light is red.

THERMOCOUPLES

These instruments use Type "E" thermocouples. Type "E" thermocouples are used to reduce the introduction of errors that can occur if thermocouples are used that contain magnetic materials. The specially constructed Cimco thermocouples can be imbedded into the 1.2 KV dry-type coils to sense the hot-spot temperature directly without concern for thermal gradients within the coils.

FAIL SAFE FEATURES

- With loss of power , Alarm turns on
- With loss of the thermocouple, Alarm and Fan relays turn on while the trip circuit does not turn on under either of the above conditions.
- If fan control switch is in off position or if fan control logic is inoperative, the trip function will turn on fans.

INSTALLATION

- Complete instructions are printed on the back side of the instrument next to the terminals.
- All relays are included in the instrument.
- 120 / 240 VAC input power selection
 - For 120VAC operation, short H1 & H3, and short H2 & H4.
 - For 240VAC operation, short H2 & H3.
- Panel mounted
- One piece installation
- Verify accuracy by reading ambient at start.
- Set points are adjustable by transformer manufacturer
- Use Type "E" thermocouple
- The red thermocouple lead is "negative".

CONSTRUCTION

All of the necessary circuitry and relays are enclosed. An attractive face plate covers the small cabinet and is used to mount the instrument in the dry-type transformer sheet metal enclosure. All connecting terminal points are located on the back of the instrument and are clearly labeled to help reduce error during installation.

DECEMBER 1990

FEATURES

• FAIL-SAFE

- FOR OPEN THERMOCOUPLE
 - METER WILL READ FULL SCALE
 - MAXIMUM MEMORY READS FULL SCALE
 - FAN, ALARM, AND TRIP LIGHTS TURN ON
 - ALARM RELAY OPERATES
 - TRIP RELAY DOES NOT OPERATE
- FOR LOSS OF POWER TO INSTRUMENT:
 - ALL LIGHTS TURN OFF
 - ALARM RELAY TURNS ON
 - MAXIMUM TEMPERATURE IS STORED:
 - RETAINED AT LEAST FOR 30 DAYS
 - NO LOSS OF ACCURACY
 - NO BATTERY POWER

• INSTALLATION INSTRUCTIONS

- COMPLETE INSTRUCTIONS ON BACK PLATE
- TERMINALS CLEARLY MARKED
- FUNCTIONAL DESCRIPTION INCLUDED
- THERMOCOUPLE CONNECTING INSTRUCTIONS
- 120 / 240-277 VAC INPUT SELECTION
 - FOR 120VAC OPERATION, SHORT H1 TO H3 AND SHORT H2 TO H4
 - FOR 240/277VAC OPERATION, SHORT H2 TO H3
- 30 AMPS OF FAN POWER
- TWO SETS OF FAN POWER TERMINALS

• OPERATING INSTRUCTIONS

- SINGLE FUNCTION CONTROLS -- ALL OF THE FRONT PANEL CONTROLS PERFORM ONE FUNCTION ONLY.
- INSTRUCTIONS FOR EACH CONTROL ARE PRINTED ON THE FRONT PANEL NEXT TO THE CONTROL.
- EXPERIENCED CONTROL ROOM OPERATORS USUALLY DO NOT REQUIRE ANY TRAINING TO OPERATE THIS INSTRUMENT.

OPERATING INSTRUCTIONS FOR MAXIMUM TEMPERATURE MEMORY

- AT START-UP
 - PRESS "PUSH TO READ"
 - PRESS "PUSH TO RESET" IF RESET IS DESIRED
- NORMAL OPERATION
 - PRESS "PUSH TO READ" TO DETERMINE MAXIMUM TEMPERATURE SINCE LAST RESET
 - PRESS "PUSH TO RESET" TO CLEAR THE MAXIMUM TEMPERATURE VALUE IN MEMORY



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OPERATIONAL CONTROLS

• FAN CONTROL SWITCH

The fan control switch can be in the automatic, manual, or off position. In automatic, fans turn on and off at the previously set fans on-and-off temperature. In the manual position, fans will be turned on at all times. In the off position, fan power is not available to the fans.

• ALARM

The alarm contacts activate at the previously set "Alarm-On" temperature. The alarm continues until the alarm condition clears, that is, when the temperature falls to the "Alarm On" temperature minus approximately 5 degrees.

• TRIP

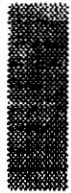
The trip contacts activate at the previously set "Trip-On" temperature. The trip continues until the trip condition clears, that is, when the temperature falls to the "Trip On" temperature minus approximately 5 degrees.

• MAXIMUM TEMPERATURE MEMORY

The maximum temperature memory is displayed on the meter by pressing the push to read control. The maximum memory is erased by pressing the push to reset control. The maximum temperature memory is retained in the electronics for 30 days or more if the power to the instrument is lost. A battery is not used to retain memory.

• FUSE

The front mounted fuse is to protect the fans. The instrument is not fused in order to provide maximum protection for the transformer.



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GENERAL SPECIFICATIONS

FEATURE	STANDARD	OPTIONAL
SCALE RANGE	0-250°C	
SCALE TYPE	DIGITAL	
ACCURACY	± 1.5 % OF FULL SCALE	
CURRENT LOOP		4-20 MILLI AMP
SET POINT RANGE	FULL SCALE	
DEAD BAND		
FANS	25°C	>10°C<50°C
ALARM AND TRIP	5°C	>5°C<20°C
FAN CONTROL	AUTO-OFF-MANUAL	AUTO-MANUAL
FAN RELAY RATINGS		
FANS 1 (SPST)	1 HP AT 120 VAC 1-1/2 HP AT 240 VAC	
FANS 2 (SPST)	1 HP AT 120 VAC 1-1/2 HP AT 240 VAC	
ALARM AND TRIP	10AMPS AT 120VAC 8 AMPS AT 240 VAC	
RELAY RATING		
THERMOCOUPLE TYPE "E"	1 REQUIRED	
SUPPLY POWER	120 OR 240 VAC	
MAXIMUM LOAD	30 AMPS	
PROTECTION	20 AMP FUSE	SINGLE POLE BREAKER ON FAN CIRCUIT
FAN EXERCISER	OPERATES FANS ONCE EVERY 5-7 DAYS FOR 6-7 MINUTES	
PANEL CUT-OUT	6.75" WIDE BY 13.875" HIGH	
HI-POT TEST*	1500 VAC, 60HZ, 60 SEC.	

***TEST NOTES**

- DURING HI-POT TEST; DO NOT INCLUDE THE THERMOCOUPLE TERMINALS IN THE TEST.
- DURING IMPULSE TEST; DO NOT CONNECT THERMOCOUPLE TERMINALS TO GROUND.

FAN MODE
SELECTOR
SWITCH

MAN
OFF
AUTO

0-250°C
METER

THERMOCOUPLE
AMPLIFIER

CONTROL LOGIC

GROUND

NO TRIP

COM

TRIP AND ALARM
CONTACT RATING
120 VAC - 10 AMPS
240 VAC - 10 AMPS
AT 1.0 PF
125 VDC - .5 AMPS
240 VDC - 0.4 AMPS

NO

COM

NC

ALARM

1 TYPE "E"
THERMOCOUPLE

T2

THERMOCOUPLE -
LEAD IS ALWAYS
RED

RESET

MAX.
TEMP.
MEMORY

READ

POWER
SUPPLY

H4

H2

H3

H1

FOR 120VAC
SHORT H1 TO H3
AND H2 TO H4
FOR 240/277VAC
SHORT H2 TO H3

H1

H4

20A
FUSE

CR1

CR1

POWER ON
FANS ON
ALARM
TRIP
STATUS LIGHTS

1

2

3

4

11

12

T1

POWER OUT
TO
FANS 1

POWER OUT
TO
FANS 2

POWER IN
120 OR
240 VAC

NOTE:
MAXIMUM TEMPERATURE MEMORY
RETAINS MEMORY DURING LOSS OF
POWER FOR AT LEAST 30 DAYS.
MOST INSTRUMENTS RETAIN MEMORY
FOR SIX MONTHS WITH NO LOSS
OF ACCURACY.

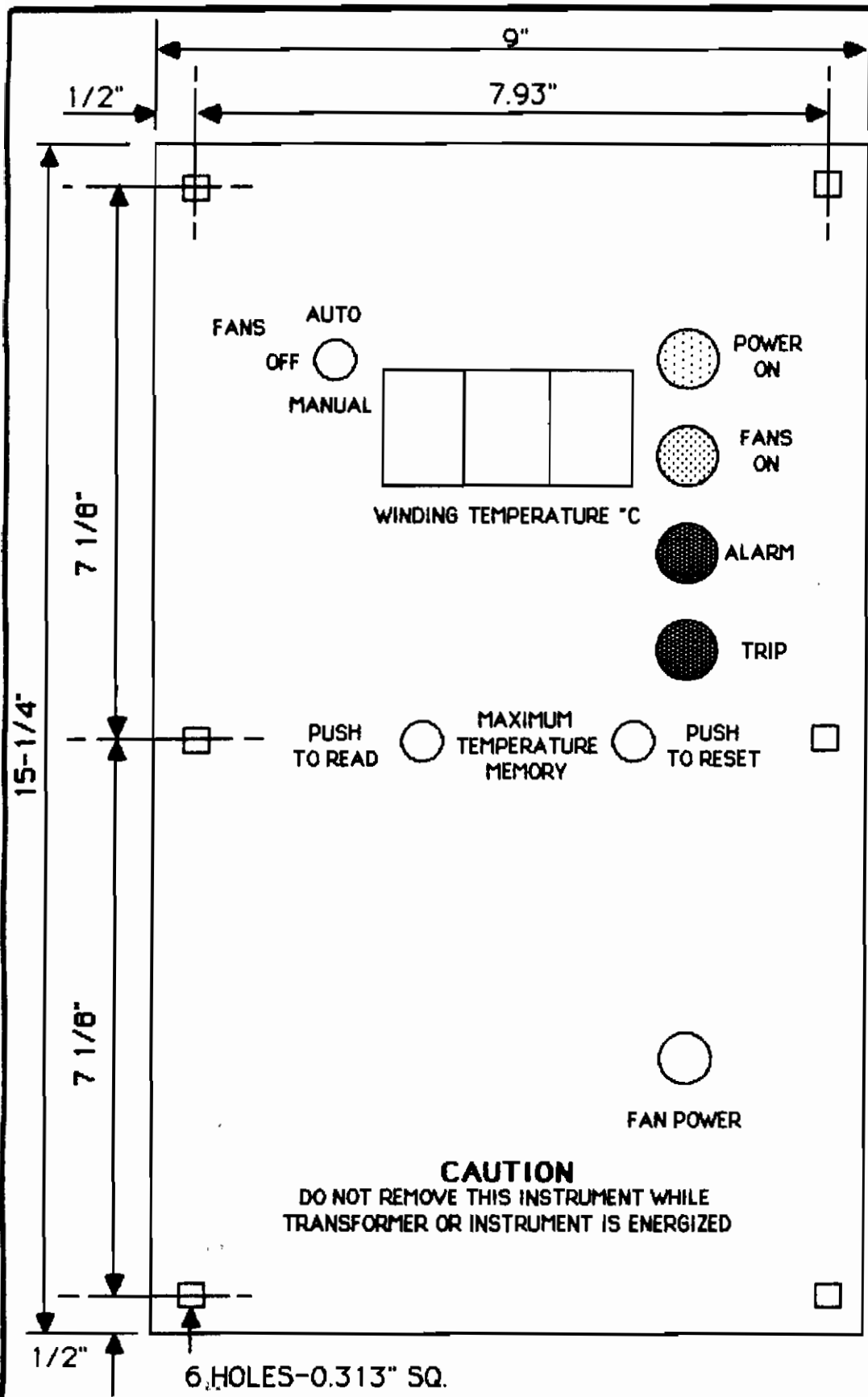
FAN CONTACTS
RATED AT 30 AMPS
FOR 120 OR 240 VAC

SERIES 40 XL-D-02
CONTROL DIAGRAM
U.L. RECOGNIZED

CIMCO ELECTRONICS, INC.
WEST MIDDLESEX, PA 16159
412-528-9559

SCALE -NONE

DEC.10,1990



NOTES

1. FACE PLATE IS 0.60" BRUSHED ALUMINUM.
2. LETTERING IS SLIGHTLY SMALLER IN SCALE THAN SHOWN.
3. BOX IS 3- 1/2" DEEP.
4. BOX IS 6- 1/2" X 11- 1/2"
5. TYPE "E" THERMOCOUPLE IS STANDARD.
6. FUSE DOES NOT INTERRUPT POWER TO INSTRUMENT.

CAUTION
DO NOT REMOVE THIS INSTRUMENT WHILE
TRANSFORMER OR INSTRUMENT IS ENERGIZED

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UL RECOGNIZED	
CIMCO ELECTRONICS, INC. WEST MIDDLESEX, PA 16159 412-528-9559	
SCALE :NONE	DEC 10,1990

40XL-0-02

Instructions for changing set-points in the field

Cimco Electronics, Inc.
P. O. Box 248; 104 Main St.
West Middlesex, PA 16159
724 (412) 528-9559

These instructions are for customers, or their authorized representatives, of Cimco Electronics, Inc. These customers may have reason to change one or more set-points of Cimco ~~40XL-0-02~~ instruments. Thermocouple simulators or milli-volt sources may be used as the temperature simulator. Temperature is displayed on the digital indicator located on the front panel of the instrument.

Do not change any set-point without permission of the transformer manufacturer since the set-points are established to protect the insulation of the transformer and to coordinate with external protection. This control system uses electronic analog logic to measure the temperature of one coil, control the fan power, alarm indication, audio alarm, trip indication, and trip and alarm switches. The system will also "remember" the maximum temperature that is experienced by the transformer coil. Lights, switches, local alarm, and fuses are mounted on the face plate. The face plate has black trim and lettering on brushed aluminum.

GENERAL INFORMATION

1. ENERGIZE THE INSTRUMENT FOR A MINIMUM OF 15 MINUTES TO ALLOW TEMPERATURES TO STABILIZE INSIDE THE INSTRUMENT. THIS SHORT WARM UP PERIOD WILL ASSURE MAXIMUM ACCURACY FOR THE ADJUSTMENTS.

2. WITH THE INSTRUMENT UPRIGHT AND SUPPORTED ON A FLAT SURFACE FACING YOU, LOCATE THE SET-POINT ADJUSTMENT HOLES ON THE TOP OF THE SHEET METAL BACK BOX. THEY MAY BE COVERED WITH A "WARRANTY VOID" STICKER.

3. FIGURE "A" LOCATES THE THREE ADJUSTMENT HOLES.

4. REMOVE THE "WARRANTY VOID" SEAL IF IT IS PRESENT OVER THESE THREE HOLES.

5. DO NOT REMOVE THE "WARRANTY VOID" STICKER OVER THE HOLES ON THE RIGHT AS VIEWED FROM THE FRONT AND THE TOP. ADJUSTMENT OF THESE THREE CONTROLS WILL VOID THE WARRANTY ON THE INSTRUMENT.

6. NOTE: CLOCKWISE ROTATION OF THE ADJUSTMENTS WILL INCREASE OR RAISE THE SET-POINT. THE DEAD BAND IS FIXED.

7. NOTE: USE OF COUNTER-CLOCKWISE ROTATION WILL DECREASE OR LOWER THE "ON" TEMPERATURE OF THE SET-POINT.

SET-POINT CHANGE INSTRUCTIONS

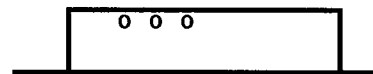
8. IF ALL SET-POINTS ARE CHANGED, START WITH THE "ALARM" SET-POINT. NEXT CHANGE THE "TRIP" AND "FANS" ON SET-POINTS.

9. USE A VERY SMALL NON-METALLIC FLAT TIP SCREW DRIVER.

10. AFTER THE CORRECT ADJUSTMENT HAS BEEN LOCATED, CONNECT THE THERMOCOUPLE SIMULATOR OR MILLI-VOLT SOURCE.

11. ADJUST THE SIMULATOR OR MILLI-VOLT SOURCE TO THE DESIRED TEMPERATURE (SHOWN ON THE FRONT PANEL OF THE INSTRUMENT) AND ADJUST THE SET-POINTS AS INSTRUCTED ABOVE.

LEFT HOLE IS FOR FANS ON ADJUSTMENT
CENTER HOLE IS FOR TRIP ON ADJUSTMENT
RIGHT HOLE IS FOR ALARM ON ADJUSTMENT



TOP VIEW

FIGURE A

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Please note updated contact information above.