

EngA[®]

ENGINEERED AIR[®]

**INSTALLATION, OPERATION
AND MAINTENANCE MANUAL**

FOR

X-TRAC2

INDIRECT FIRED HEATING CONTROLLER



UNIT MODEL NO. _____
UNIT SERIAL NO. _____
SERVICED BY: _____
TEL. NO: _____

**CANADIAN
HEAD OFFICE
AND FACTORY**

**1401 HASTINGS CRES. SE
CALGARY, ALBERTA
T2G 4C8
Ph: (403) 287-4774
Fx: 888-364-2727**

**USA
HEAD OFFICE
AND FACTORY**

**32050 W. 83rd STREET
DESOTO, KANSAS
66018
Ph: (913) 583-3181
Fx: (913) 583-1406**

**CANADIAN
EASTERN FACTORY**

**1175 TWINNEY DRIVE
NEWMARKET, ONTARIO
L3Y 5V7
Ph: (905) 898-1114
Fx: (905) 898-7244**

SALES OFFICES ACROSS CANADA AND USA

Retain instructions with unit and maintain in a legible condition.
Please give model number and serial number when contacting
factory for information and/or parts.

www.engineeredair.com

INTRODUCTION

Read this manual thoroughly before operating or servicing this unit.

The X-TRAC2 and all of its expansion modules have been certified by Intertek (ETL) for use with Engineered Air appliances only, evaluated to CSA 22.2 No. 24 Temperature Indicating and Regulating Equipment and UL873 Standard for Safety Temperature Indicating and Regulating Equipment. This is a User Operation Manual and therefore not subject to evaluation.

If any errors or omissions are noted please contact the nearest Engineered Air Technical Service Department.

To ensure warranty is honored, only qualified personnel should be employed for service or troubleshooting. If further information is required please contact the nearest Engineered Air sales office.

There are two sets of electrical drawings and function sheets provided with the appliance. One set is in an envelope which also contains the Operation, Installation and Maintenance manual(s). This package is for copying, then should either be returned to the appliance or stored in a safe place. The other set is attached to the control panel door and should never be removed.

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CONTACT INFORMATION

Canadian Head Office and Factory

1401 Hastings Cres. SE
Calgary, Alberta, Canada
T2G 4C8
PH: (403) 287 4774
FX: 1 888 364 2727

USA Head Office and Factory

32050 W. 83rd Street
De Soto, Kansas, USA
66018
PH: (913) 583 3181
FX: (913) 583 1406

Canadian Eastern Factory

1175 Twinney Drive
Newmarket, Ontario, Canada
L3Y 5V7
PH: (905) 898 1114
FX: (905) 898 7244

WARNINGS, CAUTIONS AND NOTICES

Warning, Caution and Notice statements are used throughout this manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent damage.

WARNING:

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION:

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE:

Indicates information considered important but not hazard related.

WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment.

WARNING:

This unit is connected to high voltages. Electrical shock could occur if instructions are not followed. This equipment contains moving parts that can start unexpectedly. Injury or death could occur if instructions are not followed. All work must be performed by a qualified technician. Always disconnect and lock out power before servicing. DO NOT bypass any interlock or safety switches under any circumstances.

CAUTION:

All the remote wiring must be complete and functional before attempting to start the appliance.

CAUTION:

It is important that the service technician understands the X-TRAC2 is a configurable controller. Its operation on one appliance of equipment may not mimic another.

CAUTION:

Adding a variable air volume system to equipment originally designed with constant air flow will void warranty, unless approved and recorded by Engineered Air.

CAUTION:

The X-TRAC2 is specifically programmed for this specific appliance. Do not replace with another controller without confirming its suitability with Engineered Air.

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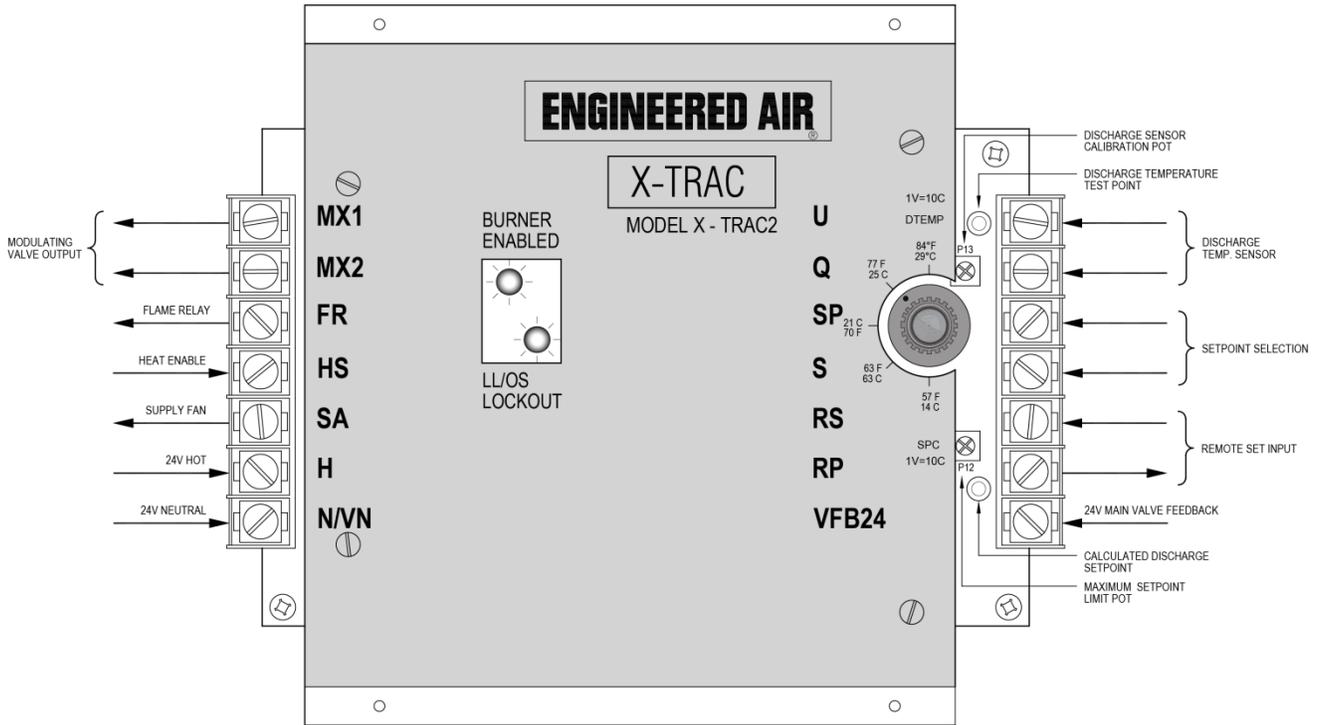
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OVERVIEW

The X-TRAC2 control is designed to control discharge air temperature, heating functions, and supply blower on Engineered Air XES, RTS, DJ and PACK furnaces.

HARDWARE INFORMATION

Control Voltage	24Vac 60Hz
Digital Output Rating	120V 10A
Temperature Rating	-40 - 150°F (65°C)
Temperature Sensor	TE6000EA3

TEMPERATURE CONTROL

The X-TRAC2 is a discharge air temperature controller. The base discharge air temperature setpoint is typically set from the control dial located on the face of the X-TRAC2. Optionally, this setpoint may be remote mounted. Refer to the wiring diagram and function.

The discharge air temperature is normally adjusted from a remote signal to maintain a comfortable temperature in the space. This is called reset. The X-TRAC2 discharge temperature can be reset from a standard single stage room heating thermostat (make break) when wired S to RP. This causes the heater to go to full heat (adjustable) on a thermostat call. A resistor in the line will, on a thermostat heat call, results in a setpoint corresponding to the resistance of the resistor. See Table 2.

SEQUENCE OF OPERATION

When terminal H is powered (24Vac), the supply output terminal SA will close, enabling the supply blower. This contact will remain closed until the power is removed from terminal H, there is a low limit, open sensor, or high limit condition. The heat switch input terminal HS allows the heat to operate, if required.

On a call for heat, output terminal FR will be energized (24Vac) to enable the ignition control and establish the flame. For the X-TRAC22 only, a feedback signal is sent to terminal VFB24 confirm the main firing valve is open. The X-TRAC2 outputs a Vdc signal (from terminals MX1 and MX2), and modulates the gas valve to maintain the required discharge air temperature. Some cycling of the burner is expected when the required temperature is below the minimum firing rate of the burner.

DIAGNOSTIC TOOLS

The X-TRAC2 has 2 LED indication lights and 2 temperature readout points for diagnostics.

Red LED: The X-TRAC2 is locked out on either low discharge air temperature limit, or open discharge air sensor.

Green LED: The FR contact is closed and the heating is enabled.

Temperature readout points are for use with a DC voltmeter. Referenced to ground, the output voltage corresponds to temperature. Multiply the DC voltage by 10 to convert the reading to degrees Celsius. For example: a reading of 2.1Vdc equals 21°C. See Table 1.

DTEMP: This will return a value that represents the actual discharge air temperature being measured by the temperature sensor.

SPC: This is the calculated temperature setpoint that the X-TRAC2 will use to maintain the discharge air temperature. This setpoint will normally correspond to the face mounted setpoint dial,

however the output may differ if reset is being used.

Note: the above temperature reading is the value at the Engineered Air sensor or setpoint. If there is a BMS (Building Management System) sensor measuring temperature, it should be located within one inch of the Engineered Air sensor. Note: The BMS sensor should only monitor temperature and not be used for control or reset.

LOW LIMIT BYPASS TIME

Note: Optional low limit sensing may be disabled. Refer to the unit function for clarification

On initial start-up the low limit circuit is bypassed for 3.5 minutes to allow the heat exchanger to reach full operating temperature, as sensed by the discharge air temperature sensor. On low limit failure the heating and supply blower will be disabled, and the previously noted red LED will be illuminated. To reset the unit after a low limit failure, simply interrupt power to the terminal H.

REMOTE SETPOINT

A remote setpoint potentiometer (pot) can be installed to terminals RS and RP, and a jumper wire between terminals S and RS. The amount of resistance determines the setpoint. Note the table below for the resistance values.

BURNER / HEATER TYPE

Field installation of the X-TRAC2 requires that it be configured to operate the particular style of burner it is being used to control. On the back of the X-TRAC2 are 2 jumpers located just above the center of the circuit board. One is marked DJ, the other marked XE/RT.

Note: Factory installed X-TRAC2's will already have the required jumper cut.

XES, RTS AND PACK FURNACES

For these style heaters, cut the jumper marked DJ.

DJ FURNACES

For this style heater, cut the jumper marked XE/RT.

LOW LIMIT ENABLE

Field installation of the X-TRAC2 requires configuration of the optional Low limit protection. It can be enabled by cutting the LL OFF jumper. This jumper is located on the back of the X-TRAC2 just below and to the right of center of the circuit board. Factory installed X-TRAC2s will already have the jumper cut if required.

Note: Cutting this jumper will also enable open sensor monitoring.

MAXIMUM TEMPERATURE POT

An additional pot P12, located just above the SPC terminal, sets the maximum discharge air temperature limit. The maximum discharge temperature setting is 115°F (46°C)

DISCHARGE SENSOR CALIBRATION

Trim pot P13, located directly below DTEMP terminal, can be used to calibrate the discharge sensor. The Engineered Air TE6000-3 sensor resistance is as shown in Table 3 below. Accurately measure the discharge temperature as close as possible to the TE6000-3 sensor. If this does not correspond to the DTEMP reading, adjust the calibration pot.

TABLES

Table 1

Vdc conversions to °C and °F.

Vdc	0.5	1.0	1.3	1.56	1.83	2.1	2.4	2.7	2.9	3.2
°C	5	10	13	15.6	18.3	21	24	27	29	32
°F	40	50	55	60	65	70	75	80	85	90

Table 2

Resistance Setpoint

Ohms	0	100	200	300	400	500	600	700	800	900	1000
°F	120	100	91	79	73	66	61	57	53	50	48
°C	50	38	33	26	23	19	16	14	12	10	9

Table 3

Sensor Resistance Chart for the Engineered Air sensor TE6000-EA3

°C	°F	Resistance Ω	°C	°F	Resistance Ω	°C	°F	Resistance Ω
-40.0	-40	602	18.3	65	983	48.9	120	1234
-34.4	-30	633	20.0	68	996	54.4	130	1269
-28.9	-20	665	20.6	69	1000.7	60.0	140	1333
-23.3	-10	698	21.1	70	1005	65.5	150	1365
-17.8	0	732	23.9	75	1026.5	71.1	160	1437
-12.2	10	768	26.7	80	1048	76.7	170	1491
-8.7	20	804	29.4	85	1070	82.2	180	1546
-1.1	30	842	32.2	90	1092	87.7	190	1602
4.4	40	881	35.6	95	1116	93.3	200	1659
10.0	50	921	37.8	100	1139	98.8	210	1718
12.8	55	942	43.3	110	1186	100.0	212	1778

Reference resistance is 1035 ohms at 77°F (25°C).