

EngA[®]

ENGINEERED AIR[®]

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

FOR

X-TRAC

INDIRECT FIRED HEATING CONTROLLER



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

**CANADIAN
HEAD OFFICE
AND FACTORY**

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CALGARY, ALBERTA
T2G 4C8
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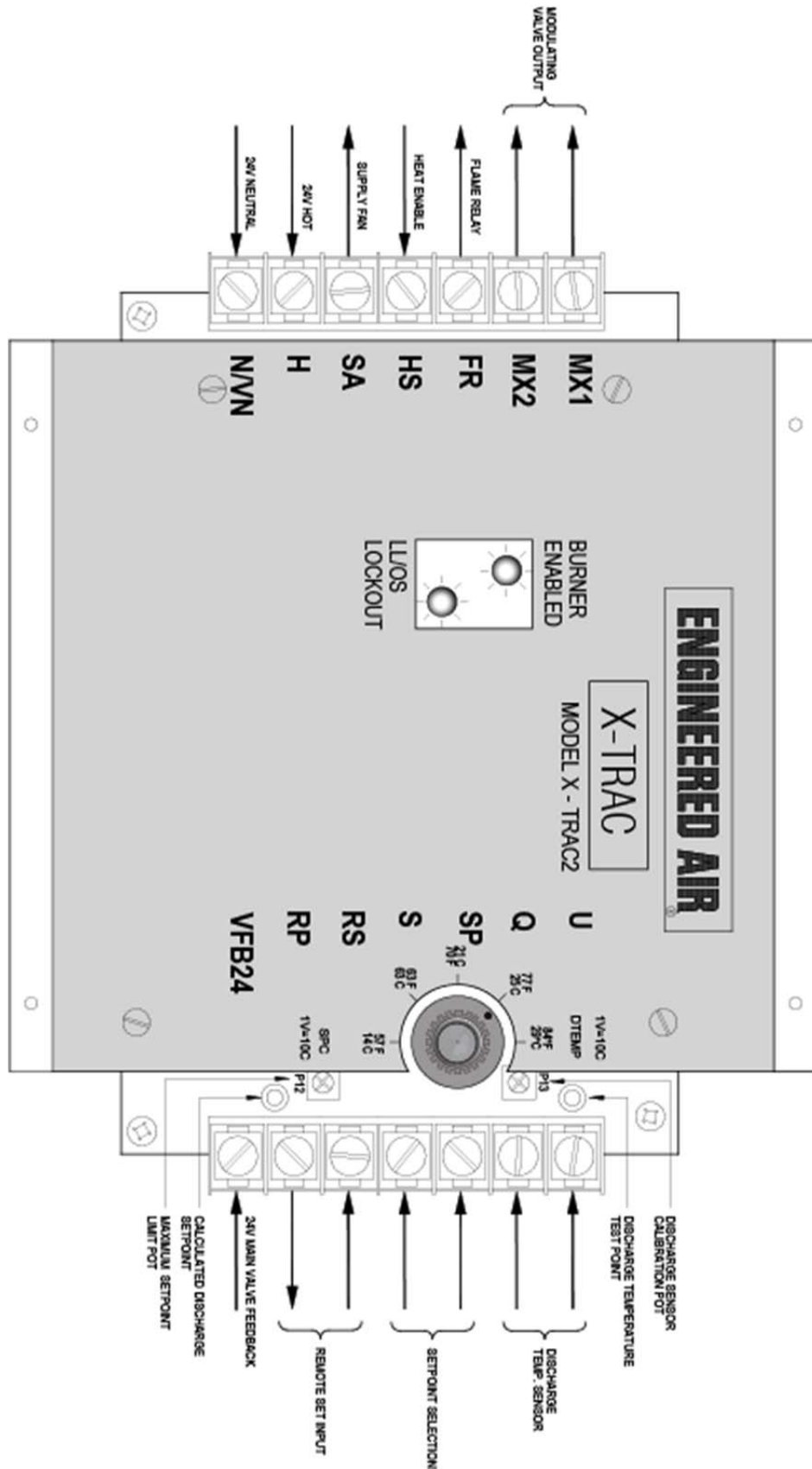
1175 TWINNEY DRIVE
NEWMARKET, ONTARIO
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SALES OFFICES ACROSS CANADA AND USA

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

X-TRAC DRAWING



12B.1

The XTRAC has been certified by Intertek (ETL) for use with Engineered Air appliances only. It has been evaluated to CSA C22.2 No. 24 Temperature-Indicating and Regulating Equipment and UL 873 UL 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 and troubleshooting. If further information is required please contact the nearest Engineered Air office.

There are two sets of electrical drawings and unit 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.

Please report any omissions to the National Service Manager.

Warning:



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

Warning:



This unit is connected to high voltages. Electrical shock or death 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 should 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.

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INTRODUCTION

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

Note: All of the remote control wiring shall be complete and operational before starting the unit.

TEMPERATURE CONTROL

The X-TRAC 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-TRAC. 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-TRAC 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 high fire on a thermostat heat 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.

A 0-10Vdc Building Management System (BMS) control signal wired _ (hot) to _ (neutral) can be used for room override.

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-TRAC2 only, a feedback signal is sent to terminal VFB24 confirm the main firing valve is open. The X-TRAC 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-TRAC has 2 LED indication lights and 2 temperature readout points for diagnostics.

Red LED: The X-TRAC 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°

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-TRAC 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.

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

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 X-TRAC 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.

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

BURNER / HEATER TYPE

Field installation of the X-TRAC requires that it be configured to operate the particular style of burner it is being used to control. On the back of the X-TRAC 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-TRAC'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-TRAC 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-TRAC just below and to the right of center of the circuit board.

Note: Factory installed X-TRACs 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.

Note: Calibration of the discharge sensor can not be performed if the burner is cycling on and off.

SENSOR TABLE

Table 3 Sensor Resistance Chart for the Engineered Air TE6000-3

°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).