exeter XL System Controller

GENERAL FUNCTION (Special Settings for High Temperature System)

The exeter XL System Controller is designed to manage a heat pump system water loop. By monitoring the water temperature, the controller can enable; heat injection or heat rejection devices to maintain appropriate system temperatures. The controller also monitors system water flow, and will enable a standby (lag) pump if the primary (lead) pump fails to initiate or maintain water flow.

Normal operation is indicated on the front panel by green LED lamps. Out of range conditions are indicated by red LED lamps and a 90 dB audible alarm. The front panel digital thermometer displays the system water temperature at the sensor.

After a power interruption or reset, the panel initiates an auto restart, there is a 3 second time delay to allow line voltage to stabilize. The loads are sequenced to prevent high inrush current.

On power-up or after a reset, the normally closed shutdown (N.C.S.) contacts are open. After 60 seconds, the N.C.S. contacts close and remain closed providing a temperature alarm or flow shutdown does not occur. The N.C.S. contacts can be wired to control the heat pumps. **Use Com. and N.O. relay contacts.**

The optional remote alarm provides an audible and visual indication of controller alarms. The audible alarm may be silenced, while the visual indication resets only with the controller.

PUMP CONTROL SEQUENCE OF OPERATION

The controller initializes the lead pump on start-up. Under normal operating conditions the lead pump runs.

The flow indicator displays the instantaneous condition of the flow switch. (green - closed, off - open).

If the loop flow does not start within 9 seconds, or stops for more then 9 seconds on the lead pump, the controller turns off the lead pump, sounds an alarm, and turns on the lag pump.

If the loop flow does not start within 9 seconds, or stops for more then 9 seconds on the lag pump, the controller turns off the lag pump, turns the flow indicator red, disables the temperature control outputs, and opens the N.C.S. contacts.

The panel reset button is used to restore the lead pump after a flow alarm.

The lead pump is automatically changed every 7 days to equalize pump wear. A slide switch located on the rear circuit board, provides for immediate change of the lead pump.

On a temperature alarm, the loop pumps are not disabled.

TEMPERATURE CONTROL FUNCTION

The following temperatures are factory set, however may be field adjusted to suit individual installations. Delay times listed are approximate.

- Below 65° F (18.3° C) the first heat relay is operated.
- Below 60° F (15.6° C) the second heat relay is operated.
- Above 100° F (37.8° C) the first stage cooling is energized after a 15 second delay.
- Above 102° F (38.9° C) the second stage cooling is energized after a 15 second delay.
- Above 105° F (40.6° C) the third stage cooling is energized after a 20 second delay.
- Above 110° F (43.3° C) the forth stage cooling is energized after a 15 second delay.
- Above 115° F (46.1° C) the high temperature alarm occurs after a 55 second delay.
- Below 50° F (10.0° C) the low temperature alarm occurs after a 35 second delay.

Temperature differentials of 4° F (2.2° C) are provided for the heat relays and 2° F (1.1° C) for the cooling. The differential is to prevent short cycling.

Temperature alarms self reset as the water loop temperature returns within range.

PROBE (INSTALLATION)

The temperature sensor is a state of the art electronic probe. It features 0.5° F (0.3° C) resolution, excellent repeatability, and unlike thermistors, does not exhibit memory. The length of the cable does not affect the accuracy of the sensor, so no infield adjustments are necessary to true up the system.

A 12" (30.5 cm) cable is provided with the probe. When making the electrical connection, probe polarity must be observed, as the controller will malfunction if it is wired in reverse. The yellow wire must go to the yellow terminal; the black wire must go to the black terminal. **Locate probe in SYSTEM RETURN** (before boiler and before cooling tower).

Up to 1,000' (300 m) of twisted pair cable can be attached to the probe with no need to readjust the controller. The connections should be soldered for best reliability. Shielded cable may be required in noisy environments.

The probe should be fully inserted in the exeter sensor well and secured in place with the brass compression fitting. The well is supplied with a small quantity of thermal compound at the bottom of the inner bore. A conduit LBA with ½" FPT is included with the sensor well to facilitate wiring. Sensor wiring should be run exclusively within its own conduit.

PANEL (INSTALLATION)

Cabinet dimensions are 13" (33.0 cm) high x 10.5" (26.7 cm) wide x 4.5" (11.4 cm) deep.

Electrical connections are made to the relays mounted and clearly labelled within the cabinet. Relays are FORM C rated for 20 amps N.O., 10 amps N.C. @ 24 VAC. A total of six ½" electrical knockouts are provided on the sides of the cabinet to allow easy access to the wiring terminals. **Loads are normally connected to COM. and N.O. relay contacts.**

Maximum power consumption is 25 VA, typically 15 VA @ 16 VAC input. The transformer supplied will provide 30 VA @ 16 VAC from 110 VAC 60 Hz, and the transformer should be mounted external to the panel.

The Flow Switch is supplied with SPDT contacts, but only the COM. and N.O. are wired to the panel. Refer to the Flow Switch manufacturer's instructions for proper installation and adjustments.

The panel should be mounted on a flat, dry, vibration-free surface. Ambient operating temperature of 32° F (0° C) to 122° F (50° C), 10% to 90% humidity, non condensing. The panel is not to be shipped or installed near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

NOTE: For line voltage control wiring, an interface must be used, which is available from the factory.

TEMPERATURE DISPLAY °F OR °C

The digital thermometer will display in Fahrenheit or Celsius. °F or °C selection is done by a slide switch located near the bottom of the display circuit board.

TOWER MODE "A" OR "B"

With the "Tower Mode" switch in position "A" cool stages 1-2-3-4 energize sequentially.

With the "Tower Mode" switch in position "B" cool stages 1-2-3 energize sequentially. On energizing stage 4, cool stage 3 is de-energised. A time delay is provided for 2-speed or Pony Motor operation in this mode.

TO READ AND/OR ADJUST TEMPERATURE SETTINGS

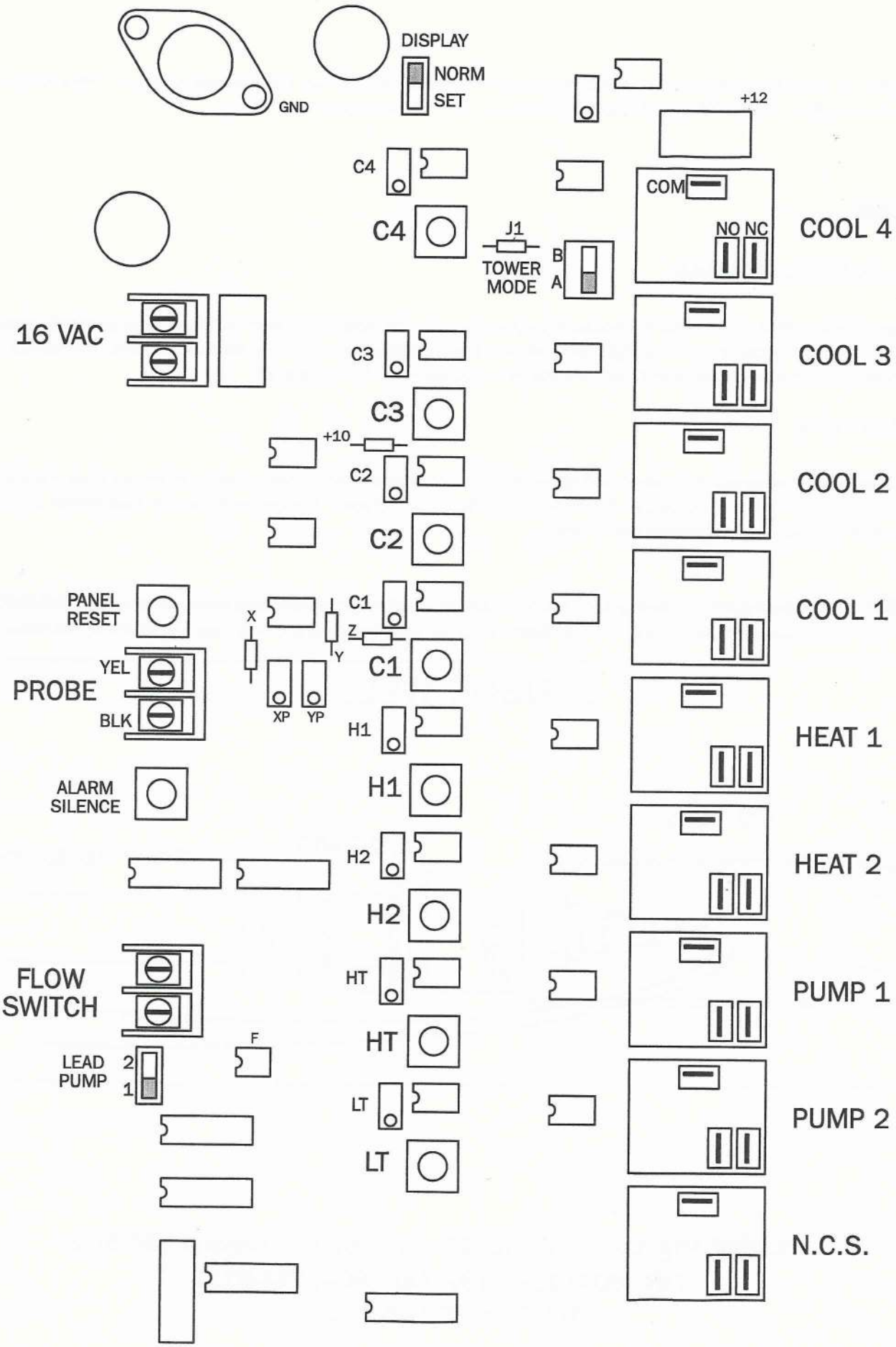
Move the "Display" switch from "Norm" to "Set".

Press and hold the appropriate push button, the set point temperature will be displayed. Be sure this stage is **NOT** energized. If energized, press "Panel Reset" and adjust within 15 seconds.

To change the set point temperature, turn the associated trimpot screw either CW to raise temperature or CCW to lower temperature.

Return "Display" switch to "Norm" when measurements and adjustments are complete.

exeter Mfg. Corp., Box 82122, Burnaby, B.C. Canada V5C 5P2
Tel.: (604) 294-1192 Fax: (604) 294-8112
Toll-Free: 800-661-1143


GND
DISPLAY
NORM
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+12
C4
COM
NO NC
COOL 4
J1
TOWER MODE
B
A
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C3
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+10
C2
COOL 2
PANEL RESET
X
Z
Y
C1
COOL 1
PROBE
YEL
BLK
XP
YP
H1
HEAT 1
ALARM SILENCE
H2
HEAT 2
FLOW SWITCH
HT
PUMP 1
F
LEAD PUMP
2
1
LT
PUMP 2
N.C.S.

The **exeter** XL SYSTEM CONTROLLER is shipped complete with : Sensor, Sensor Well, Transformer, and *Flow Switch.
(* McDonnell & Miller, Model FS4-3, P/N 114400, or equal, 150 PSI maximum.)

OPTIONS:

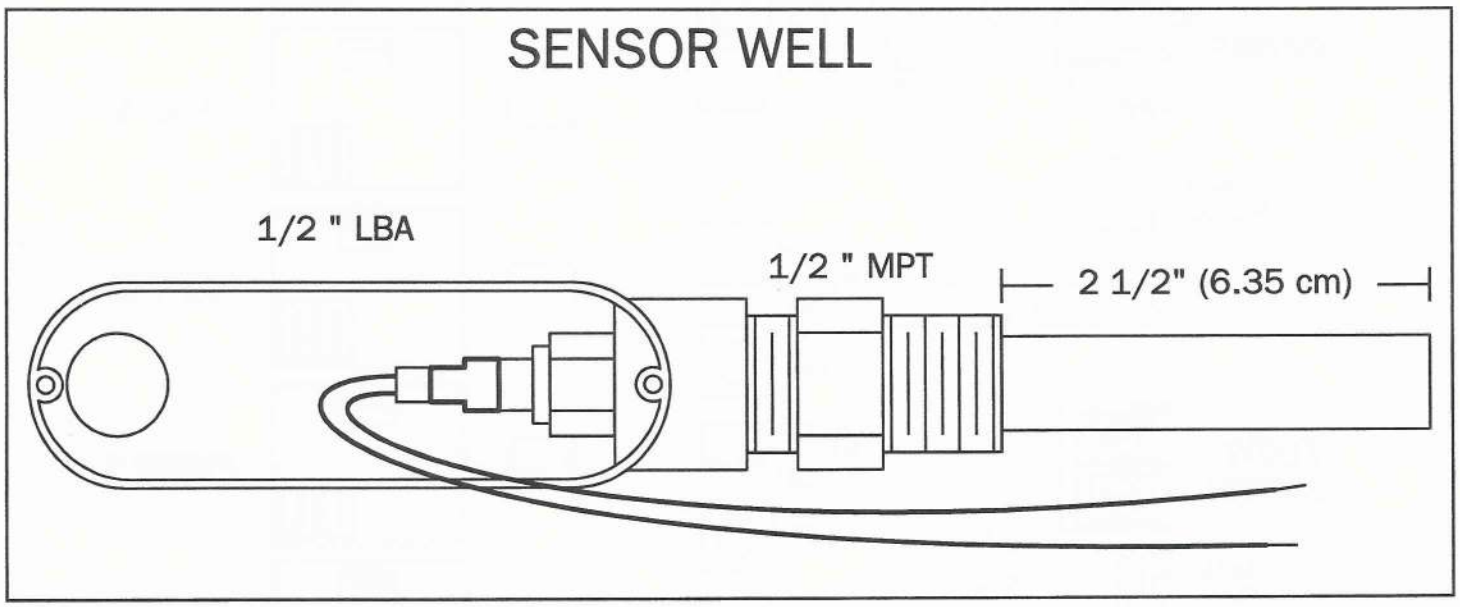
ALARM INTERFACE MODULE:

The Alarm Interface Module provides the necessary signals to drive the optional Remote Alarm. It also provides auxiliary alarm outputs. Dry contacts close to indicate High Temperature, Low Temperature, and Flow alarm conditions. This allows the Alarm Interface Module to be connected with Telephone Diallers, DDC systems, Computers, etc.

REMOTE ALARM:

Remote Alarm provides remote (hard wired) indication of alarm conditions - High Temperature - Low Temperature - Flow #1 and Flow #2 indicated by LEDs and a piezo buzzer. A buzzer silence button is included. The device fits a standard switch box. The Alarm Interface Module is required to operate this device.

CAUTION: When installing a PVC piping system, it is necessary to install a high temperature safety thermostat DOWN STREAM from the heat source. Consult pipe manufacturer's specifications for temperature setting of this heat source safety shutdown.



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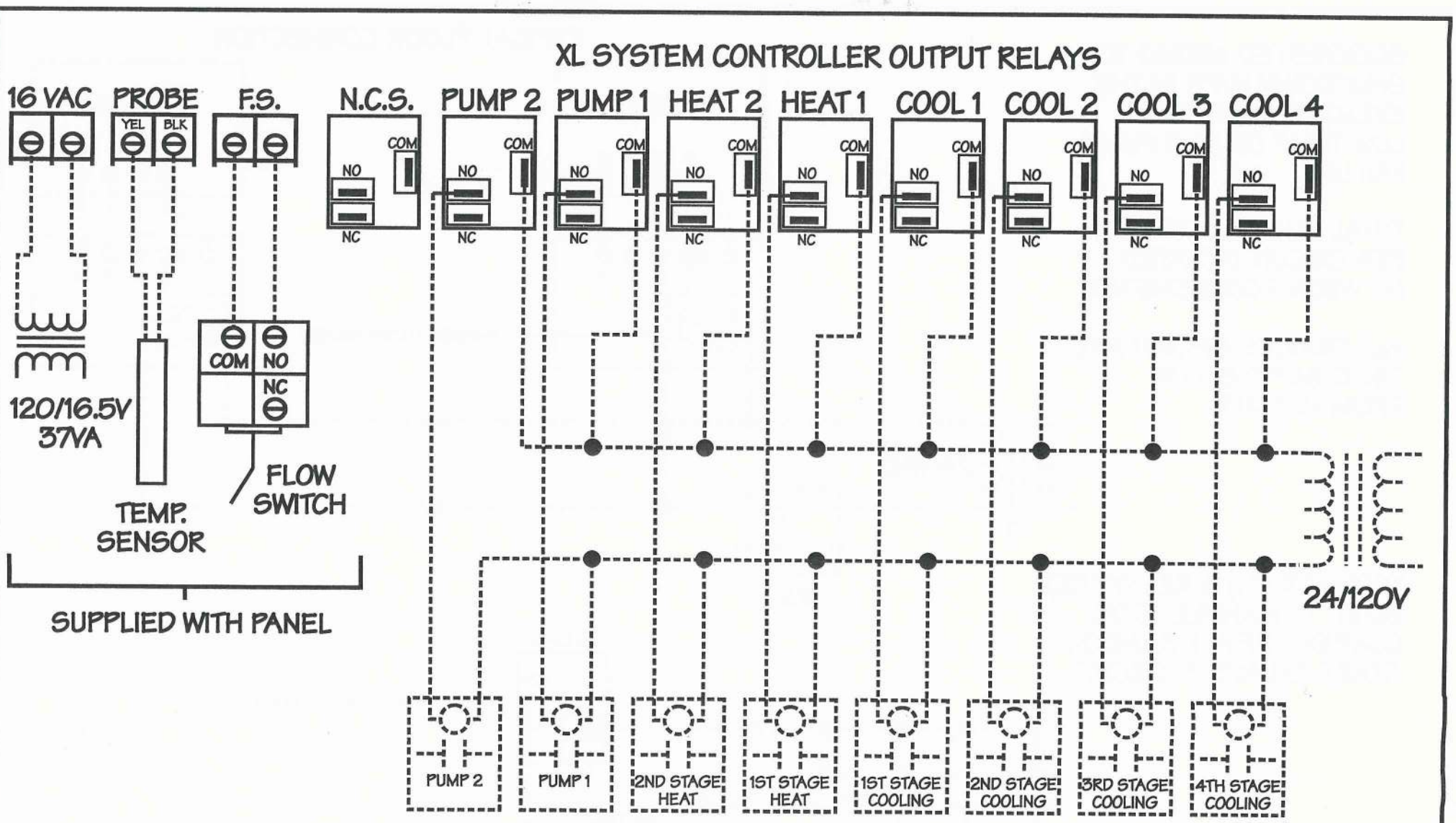


exeter MANUFACTURING BURNABY, B.C.

NAME: SUGGESTED CONTROL WIRING

DATE: 4/22/04

FILE: XLW-1_BN.CDR

XL SYSTEM CONTROLLER

REV.:

DRAWING NO.: XLW-1-B

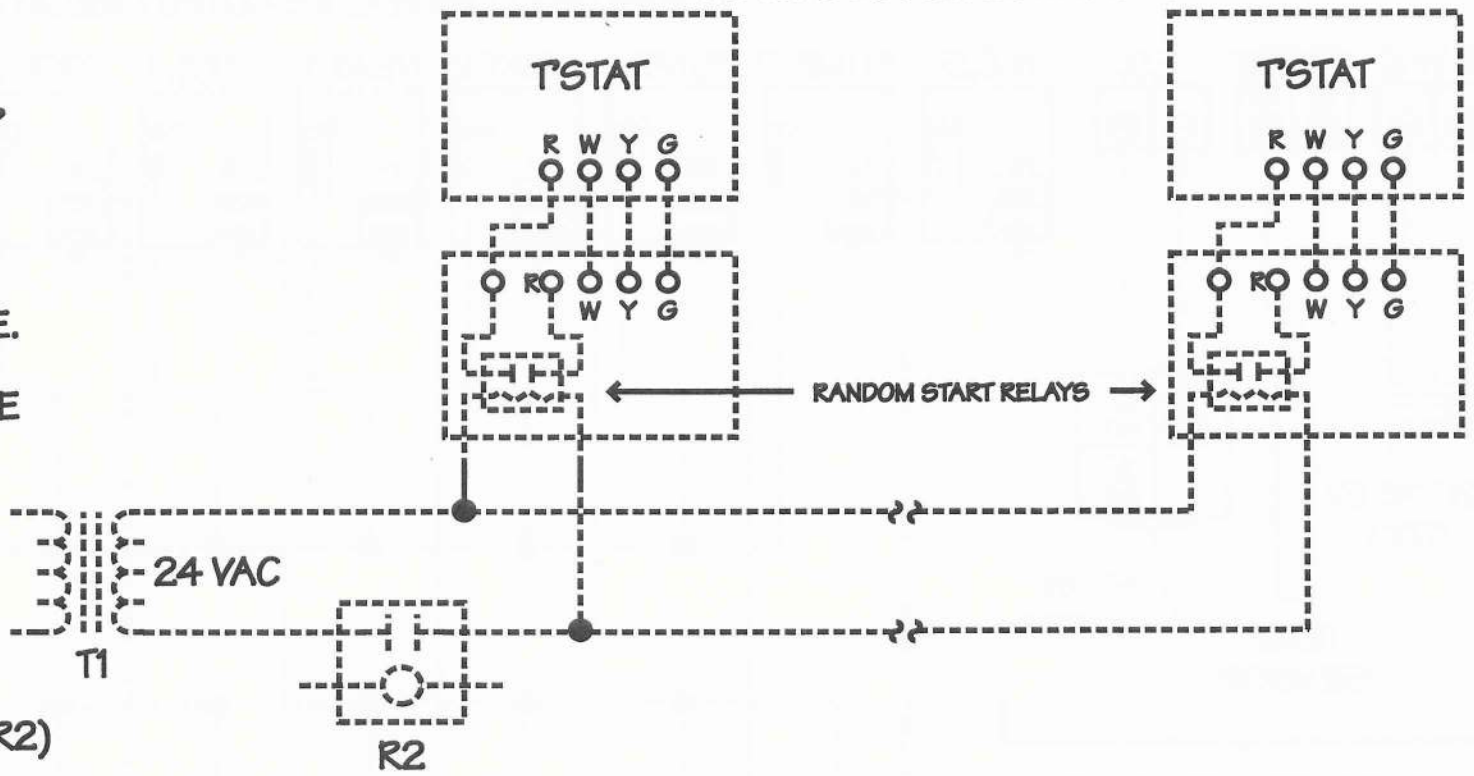
SUGGESTED WIRING TO SHUTDOWN H/PS IN THE EVENT OF HIGH TEMP, LOW TEMP OR LAG PUMP FAILURE.

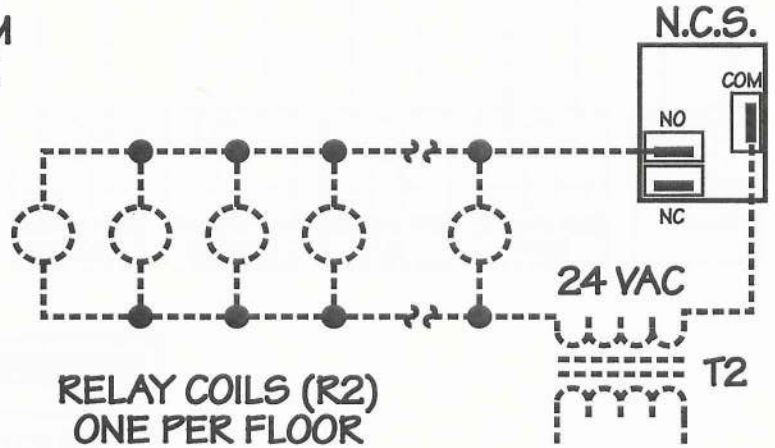
TOTAL NUMBER OF H/PS PER CIRCUIT DICTATED BY WIRING CONVENIENCE.

ALL DEVICES SHOWN ARE FIELD SUPPLIED OR FROM H/P MFR.

XFORMER (T1) & RELAY (R2) SIZED TO HANDLE TOTAL CURRENT OF ALL RANDOM START RELAYS IN CIRCUIT.

TYPICAL FLOOR CONNECTION





N.C.S. RELAY IN EXETER PANEL

RELAY COILS (R2) ONE PER FLOOR

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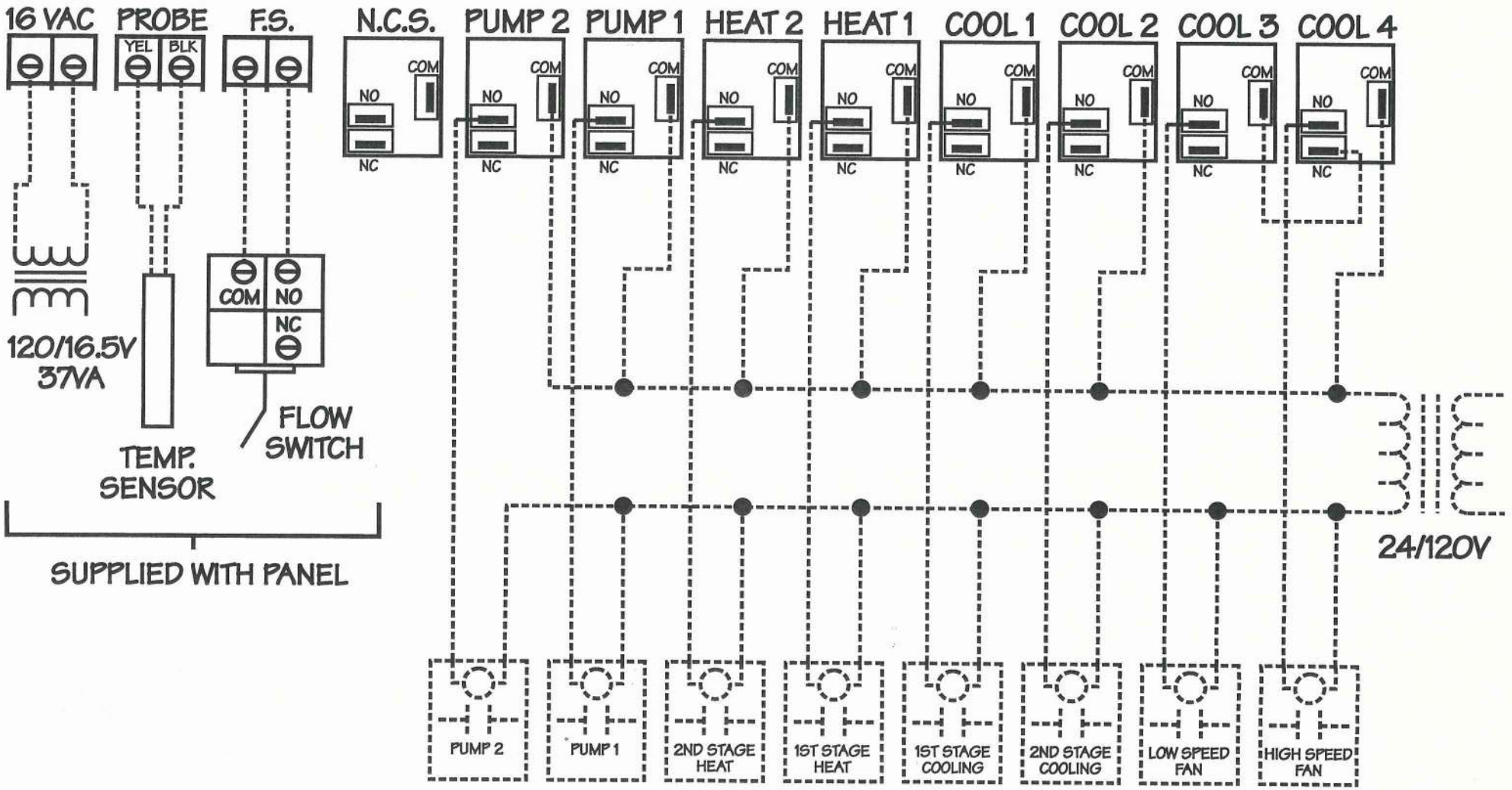
NAME: SUGGESTED N.C.S. WIRING		
DATE: 8/28/03	XL SYSTEM CONTROLLER	REV.
FILE: XLW-21_BN.CDR		DRAWING NO.: XLW-2-A

XL SYSTEM CONTROLLER OUTPUT RELAYS

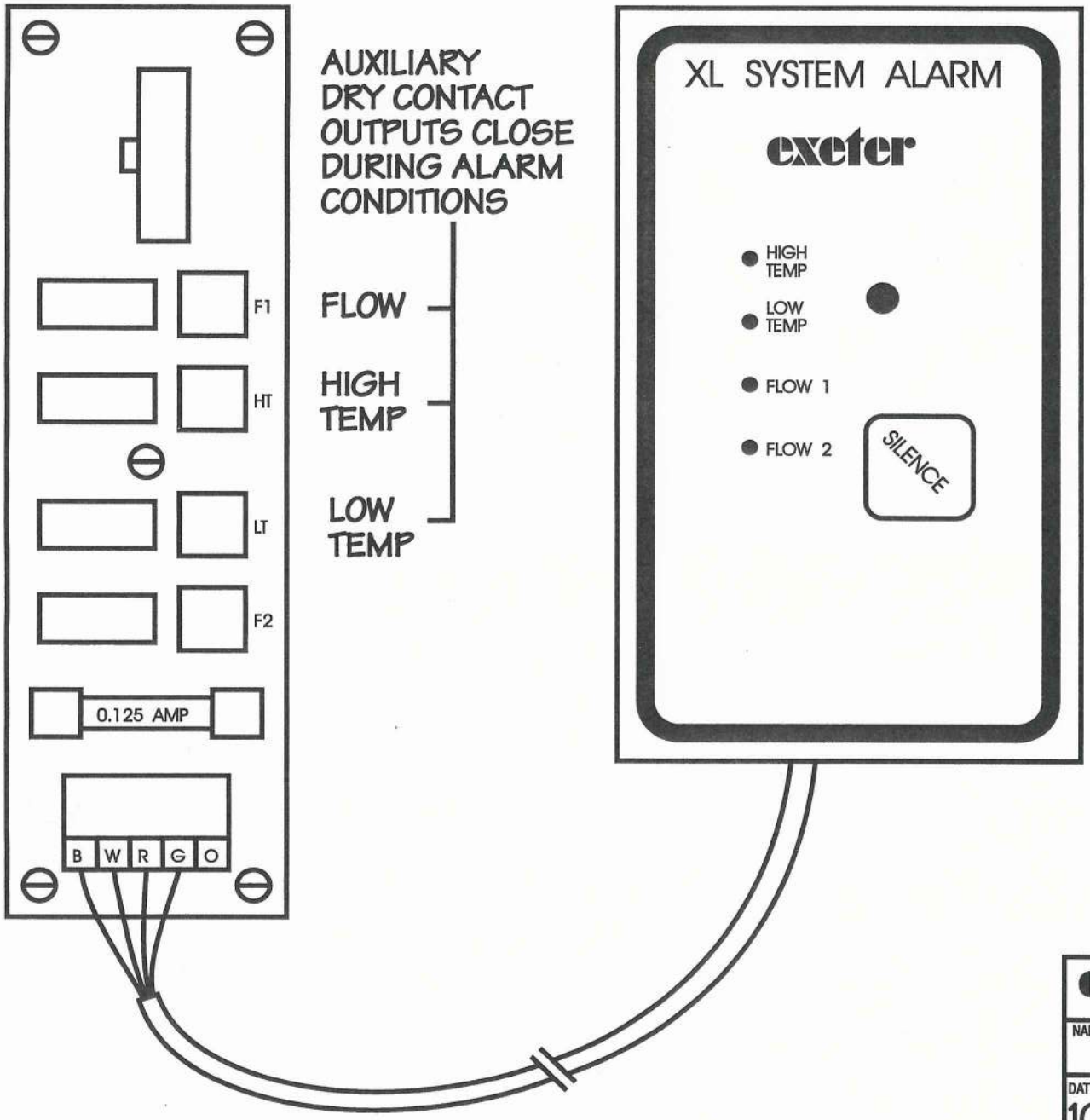


LOW SPEED FAN IS INTERLOCKED WITH HIGH SPEED FAN.
TOWER MODE SWITCH MUST BE IN POSITION "B".

exeter MANUFACTURING BURNABY, B.C.

NAME: TWO SPEED TOWER MOTOR SYSTEM

DATE: 4/22/04	XL SYSTEM CONTROLLER	REV.
FILE: XLW-3_BN.CDR		DRAWING NO.: XLW-3-B



REMOTE ALARM	INTERFACE TERMINAL
BLACK	B
WHITE	W
RED	R
GREEN	G

NOTE: STRANDED WIRE MUST BE USED FROM INTERFACE

EG. BELDEN 8444

exeter MANUFACTURING BURNABY, B.C.

NAME: REMOTE ALARM & INTERFACE

DATE: 10/3/03

FILE: RA&I_BN.CDR

Option

REV.

DRAWING NO.: RAI-A