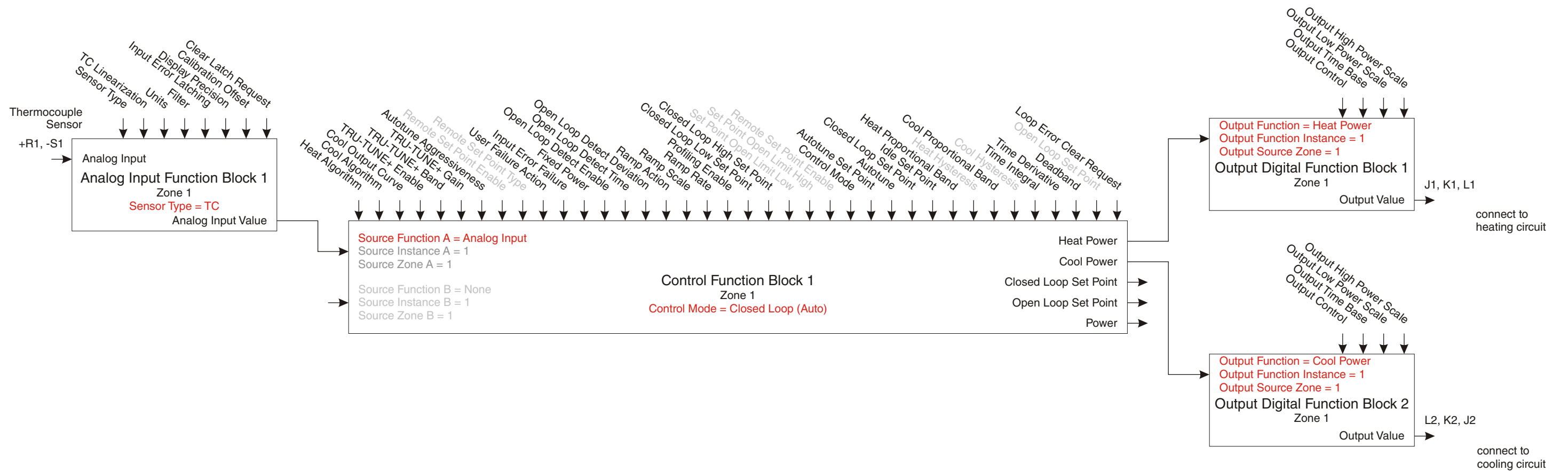# Typical heat/cool control loop diagram

Example 1A - Heat/Cool, closed loop, PID control without remote SP

Real world use may be to control chamber temperature.

Demonstrates use of Analog Input, Control, and Digital Output Function Blocks

Note:
Control Loop 1 must use PV 1 or Analog Input 1
Control Loop 2 must use PV 2 or Analog Input 2
Control Loop 3 must use PV 3 or Analog Input 3
Control Loop 4 must use PV 4 or Analog Input 4

Thermocouple
Sensor

+R1, -S1

Analog Input Function Block 1 inputs: Sensor Type, TC Linearization, Units, Input Error Latching, Display Precision, Calibration Offset, Filter, Clear Latch Request

Analog Input
Analog Input Function Block 1
Zone 1
Sensor Type = TC
Analog Input Value

Control Function Block 1 inputs: Heat Algorithm, Cool Algorithm, Cool Output Curve, TRU-TUNE+ Enable, TRU-TUNE+ Band, TRU-TUNE+ Gain, Autotune Aggressiveness, Remote Set Point Enable, Remote Set Point Enable, User Failure Action, Input Error Failure, Fixed Power, Open Loop Detect Enable, Open Loop Detect Time, Open Loop Detect Deviation, Ramp Action, Ramp Action, Ramp Scale, Ramp Rate, Profiling Enable, Closed Loop Low Set Point, Closed Loop High Set Point, Set Point Open Limit Low, Set Point Open Limit High, Remote Set Point Enable, Control Mode, Autotune, Closed Loop Set Point, Idle Set Point, Autotune Set Point, Heat Proportional Band, Cool Proportional Band, Heat Hysteresis, Cool Hysteresis, Time Integral, Time Derivative, Deadband, Open Loop Set Point, Loop Error Clear Request

Source Function A = Analog Input
Source Instance A = 1
Source Zone A = 1

Source Function B = None
Source Instance B = 1
Source Zone B = 1

Control Function Block 1
Zone 1
Control Mode = Closed Loop (Auto)

Heat Power
Cool Power
Closed Loop Set Point
Open Loop Set Point
Power

Output Digital Function Block 1 inputs: Output Control, Output Time Base, Output Low Power Scale, Output High Power Scale

Output Function = Heat Power
Output Function Instance = 1
Output Source Zone = 1
Output Digital Function Block 1
Zone 1
Output Value

J1, K1, L1

connect to
heating circuit

Output Digital Function Block 2 inputs: Output Control, Output Time Base, Output Low Power Scale, Output High Power Scale

Output Function = Cool Power
Output Function Instance = 1
Output Source Zone = 1
Output Digital Function Block 2
Zone 1
Output Value

L2, K2, J2

connect to
cooling circuit

User parameter settings in RED

Revision A

Information Flow

EZ-ZONE RM Application Example - using function blocks
Print on 11" x 17" landscape paper for best viewing