CONFIGURATION INSTRUCTIONS FOR PCMXF CONTROLLER FAHRENHEIT

Hansen PCMXF controllers are factory programmed to provide precise control of refrigerant superheat/subcooling in refrigeration applications when used in conjunction with Hansen Sealed Motor Valves. It is expected that the controller as shipped from the factory will give reasonable to very good control. If control difficulties occur during startup, it is recommended to thoroughly check system and components for proper installation, operation, and sensor location before attempting to tune the temperature controller. Upon power-up, the controller will be in operator mode.

Utilizing the West 6100*PLUS* Controller

These Instructions apply to the West 6100**+**(*PLUS)* Controller. If your controller does not have a "**+"** suffix; that is, West 6100 instead of West6100**+**, contact factory for proper instructions.

OPERATOR MODE

1. In operator mode, the process superheat/subcooling is displayed in the uppermost display, of the WEST 6100**+** controller, with the superheat/subcooling setpoint just below it. Superheat is represented by positive numbers, and subcooling is represented by negative numbers.

2. The superheat/subcooling setpoint can be adjusted by depressing the up or down keys of the controller.

3. MANUAL OPERATION of the Sealed Motor Valve may be performed at the controller by depressing the manual (AUTO/MAN) key. When in manual, the lower display will show valve **P**osition setpoint as **"P (position)"**. For example, **"P 0"** the valve is closed; **"P 50"** the valve is half open; **"P100"** the valve is wide open. Manual operation is useful in recalibrating the valve, or for manual override of the control system. The valve will remain at the manual position until the manual position is altered, or if control is returned to automatic operation. To return to automatic operation, depress the manual (AUTO/MAN) key again.

There are four modes of display within the West 6100*PLUS* controller, which is the control unit used in the Hansen PCMXF Sealed Motor Valve Superheat/Subcooling Control System: operator mode; setup mode; configuration mode; information mode. Field alteration of the controller configuration mode is not recommended.

Controller tuning, that is, adjusting the P-I-D parameters, is performed in the setup mode, explained below.

SET UP MODE (*manual tuning of the superheat/subcooling controller)*

1. Check the connections of the valve, HPT sensor, and 24VAC power in accordance to the Hansen wiring installation drawing 7502-64.

2. Start with the controller in operator mode with the upper display showing the actual superheat/subcooling, and the lower display showing the superheat/subcooling set point.

3. Hold down the "scroll" (circular arrow) key and press the "up" arrow key. **"SLCt"** will be displayed in the lower display. Press the "up" arrow until **"SEtP"** is displayed in the upper display.

   SEtP
   SLCt will be displayed.

4. Press the "scroll" (circular arrow) key until "**Uloc"** is displayed. Press the "up" arrow until

   10
   ULoc is displayed.

5. Scroll (circular arrow key) through the setup parameters and set each parameter according to the TABLE 1, next page.

TABLE 1

SET UP PARAMETERS	DESIRED VALUES	COMMENTS
FiLt	2.0	(two second filter to reduce noise problems on the milliamp input)
OFFS	0.0	(offsets the displayed superheat/subcooling from the actual superheat/subcooling)
PPLJ	0	(** a read-only, useless trivia in our application)
Pb_P	10.0	(THIS IS WHERE THE **PROPORTIONAL BAND** IS SET AND STORED. AUTOTUNE WILL ADJUST THIS VALUE WHILE AUTOTUNE IS ACTIVE.)[0.00 = ON/OFF CONTROL]
ArSt	0.45	(THIS IS WHERE THE **INTEGRAL TIME CONSTANT** IS SET AND STORED. AUTOTUNE WILL ADJUST THIS VALUE WHILE AUTOTUNE IS ACTIVE.)[0.00 = OFF]
rAtE	0.00	(THIS IS WHERE THE **DERIVATIVE TIME CONSTANT** IS SET AND STORED. AUTOTUNE WILL ADJUST THIS VALUE WHILE AUTOTUNE IS ACTIVE.)[0.00 = OFF]
biAS	50	(THIS PARAMETER ALLOWS THE CONTROLLER TO UNBALANCE THE CONTROL RESPONSE TO ACT MORE AGGRESSIVELY ABOVE OR BELOW THE SETPOINT UPON STARTUP. A BIAS OF 50 IS NEUTRAL. A BIAS OF 25 CAUSES A MORE AGGRESSIVE RESPONSE WHEN THE SUPERHEAT/SUBCOOLING IS ABOVE SETPOINT, AND LESS AGGRESSIVE WHEN THE SUPERHEAT/SUBCOOLING IS BELOW SETPOINT. A BIAS OF 75 CAUSES A MORE AGGRESSIVE RESPONSE WHEN THE SUPERHEAT/SUBCOOLING IS BELOW SETPOINT, ETC. POSSIBLE SETTING IS 0.0 TO 100).
SPuL	30.0	(the maximum limit for setpoint adjustment)
SPLL	-30.0	(the minimum limit for setpoint adjustment)
OPuL	100	(the maximum valve position limit, set at 100 % allows the valve to open wide)
PhA1	25.0*	(THIS IS WHERE THE **HIGH ALARM SETPOINT** IS SET AND STORED. *SET THIS VALUE TO THE DESIRED HIGH-ALARM SETPOINT APPROPRIATE FOR YOUR APPLICATION).
AHy1	5.0	(**ALARM HYSTERESIS** SETTING, THE PERCENT BELOW THE PhA1 ALARM SETPOINT WHERE THE ALARM TURNS BACK OFF.)
APt	diSA	(diSA DISABLES; EnAb ENABLES THE **AUTO P-I-D PRE-TUNE**).
PoEn	EnAb	(diSA DISABLES; EnAb ENABLES **MANUAL CONTROL**. MANUAL CONTROL ALLOWS THE VALVE TO BE MANUALLY OPENED OR CLOSED AT THE CONTROLLER PANEL.)
SPr	diSA	(setpoint ramp enable; disabled for superheat/subcooling control)
rP	-	(ramp rate; disabled for superheat/subcooling control)
_SP1 SP2	5.0 30.0	(setpoint 1 and setpoint 2 values. Setpoint 2 is used to shut the valve when the defrost contacts are closed. Setpoint 1 is accessed using the arrow keys in operator mode.)
SLoc	10	(password value to enter into configuration mode)

6. To exit the set up mode, press and hold the “scroll” (circular arrow) key and press the “up” arrow key. Press the “up” arrow key until

Optr
SLCt is displayed.

7. Press the “scroll” (circular arrow) key. Controller will resume operator mode.

CONFIGURATION MODE *(Changes the basic function of the controller)*

Changes to the configuration of the controller would be considered unusual. The most common instance is changing the operation from a reverse-acting (filling) application to a direct-acting (draining) application. Any changes to the configuration parameters will corrupt the setup parameters, requiring reprogramming of the setup parameters.

1. Check the connections of the valve, HPT sensor, and 24VAC power in accordance to the Hansen wiring installation drawing 7502-64.

2. Start with the controller in operator mode with the upper display showing the actual superheat/subcooling, and the lower display showing the superheat/subcooling set point.

3. Hold down the “scroll” (circular arrow) key and press the “up” arrow key. **“SLCt”** will be displayed in the lower display. Press the “up” arrow until **“ConF”** is displayed in the upper display.

ConF
SLCt will be displayed.

4. Press the “scroll” (circular arrow) key until “**Uloc”** is displayed. Press the “up” arrow until

20
ULoc is displayed.

5. Scroll (circular arrow key) through the setup parameters and set each parameter according to the CONFIGURATION TABLE, below. Changes to configuration parameters using the “up” and “down” keys will show flashing temporary values in the display. To accept the new value, press the AUTO/MAN key to enter the new value into the controller, evidenced by a non-flashing, continuous value in the display.

CONFIGURATION FACTORY SETTINGS (REFERENCE)

PARAMETER	DESIRED VALUE	COMMENTS
inPt	4-20	(configures the controller to accept a 4-20 mA input)
ruL	30.0	(default upper limit of the controller)
rLL	-30.0	(default lower limit of the controller)
dPoS	1	(decimal point position)
CtYP	SnGL	(Single-acting control type)
CtrL	dir	(direct-acting control; valve opens wider with rising superheat/subcooling)
ALA1	P_Hi	(alarm 1 trips on high superheat)

PhA1	25.0*	(THIS IS WHERE THE **ALARM SETPOINT** IS STORED. *SET THIS VALUE DURING SETUP MODE; NOT HERE).
AHy1	5.0	(alarm 1 hysteresis value.)
ALA2	nonE	(no alarm 2 installed.)
LAEn	diSA	(loop alarm is disabled. Unless system is finely tuned, loop alarm may nuisance trip.)
lnhi	nonE	(no alarms are inhibited)
USE1	Pri	(output 1(4-20mA) is primary control output)
tyP1	4_20	(output 1 is 4-20mA)
USE2	Or_r	(output 2 is alarm, NORMALLY OPEN contact closes upon high superheat alarm)
diSP	2	(display strategy 2 displays process superheat/subcooling in upper display, setpoint in lower display, and allows setpoints to be adjusted)
diGi	diSI	(Defrost input terminals activate secondary setpoint)
CLoc	20	(password value to enter into configuration mode)

6. To exit the set up mode, press and hold the “scroll” (circular arrow) key and press the “up” arrow key. Press the “up” arrow key until

   Optr
   SLCt is displayed.

7. Continue to SET UP MODE on page two of these instructions. SET UP parameters must be reset to the desired values any time the configuration parameters have been changed.

AUTOTUNING

Autotuning is possible, but not recommended for superheat/subcooling control. Very good to excellent control can be achieved by manually tuning, using primarily proportional (Pb_P in setup mode) control, with a small integral (ArSt) value. If the system seems sluggish, halve Pb_P. If the system swings excessively, double Pb_P. Avoid tuning during light load conditions. Some hunt is normal at low load conditions.

HANSEN TECHNOLOGIES CORPORATION
6827 High Grove Boulevard
Burr Ridge, Illinois 60527 USA
Support: (800) 426-7368
http://www.hantech.com