SENSORI® EEV DRIVER MANUAL - *VERSION* 2.0

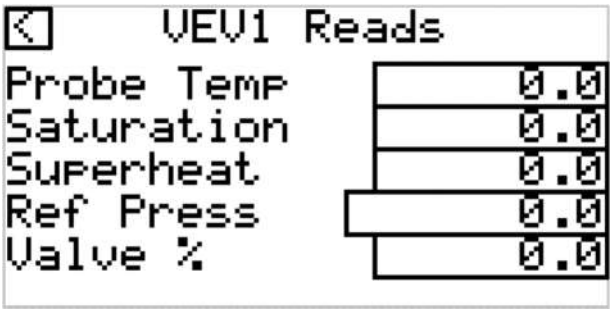
01/2025

OXFORD ENERGY SOLUTIONS

Contents

SENSORI CONTROL WITH VEV DRIVER

STATUS



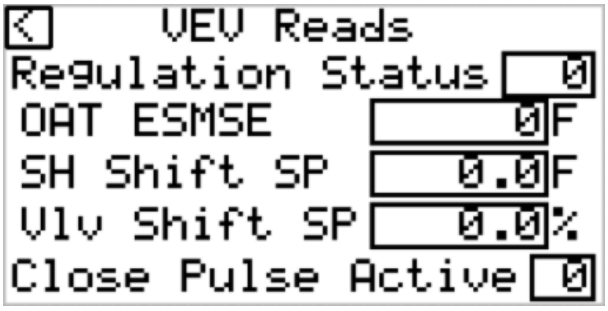
Probe temp = Temperature probe located on suction line at outlet of evaporator as installed by contractor

Saturation = The SST of the selected refrigerant based on its current pressure

Superheat = The calculated superheat in real time

Ref Press = The pressure of the suction line where the suction line transducer was installed by contractor

Valve % = EXV valve operating % in real time.



Indicates the current **Regulation Status**:

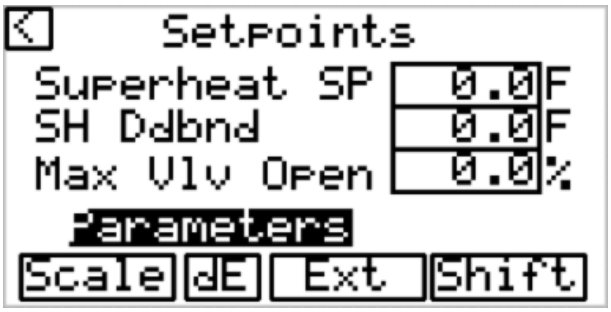
- 0= OFF
- 1=SH
- 2= MOP
- 3=CONTINUOUS MODULATION
- 4=EXTERNAL LIMITATION
- 5=START
- 6=STOP
- 7=DEFROST
- 8=MANUAL
- 9=ALARM

OAT ESMSE (Only Available on Sensori Case Management 18IO) – Outdoor Air temperature sent over TCP/IP through Sensori OLPP HMI Scada System. This Outdoor Temperature is generated from "Sensori Main Management" and sent to all Sensori Case Management controllers through Scada when enabled.
SH Shift SP – Superheat Setpoint Shift based on Outdoor Temperature used in a linear scale, for setting superheat setpoint to improve Case efficiency and minimize compressor superheat. As Outdoor temperature increases, superheat setpoint will decrease. See Setpoints for more details.
Vlv Shift SP – Electronic Valve Max open Shift Setpoint. Max open setpoint of valve when "Vlv Shift" is enabled. This is used to prevent Electronic Valve from opening to far during cooling and causing flooding due to "Lazy" coils and possible slow reaction time of valve. Max valve should always be set on cases as a safety, in case of sensor fails, to prevent cases from flooding. See setpoints for more details.
Close Pulse Active – Valve Closing pulse active will indicate "1" when valve goes to close to ensure no step loss after valve has been running for x time set in setpoints only when this feature is enabled. See Setpoints for more details.

SETPOINTS

See Schneider's Manual (Modicon M172 Electronic Expansion Valve Driver) for more information and selection of setpoints.
https://download.schneider-electric.com/files?p_enDocType=User+guide&p_File_Name=M172-EEV-Driver-User-Guide-EN-EIO0000004034-02.pdf&p_Doc_Ref=EIO0000004034
Or Scan **QR Code** Below

*Certain Parameters must require a power cycle/**Modification Reset** to the device for change to take effect and save. **Refer to Schneider's Manual to see list of parameters that need to be reset**.



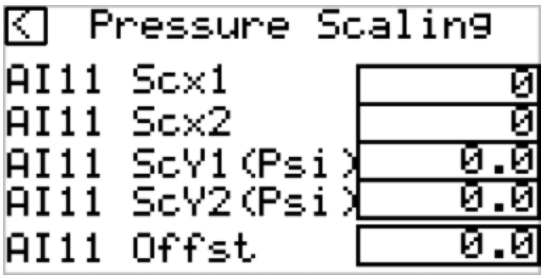
Set ***Superheat Setpoint*** for Electronic valve to modulate at.

Note: when Superheat Setpoint Shift is enabled, the actual superheat setpoint the valve will be listening to will change based on ambient and shift conditions. Please be aware of external parameters that will affect valve modulation, such as continuous modulation, superheat and valve shift, and dynamical setpoints.

Superheat Regulation Deadband/DeadZone. The dead zone is applied to the P and D component of the PID output, not to the integral one, to obtain better results in the SH control.

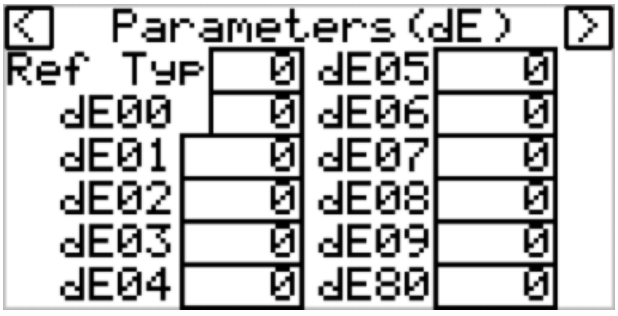
Once a system has been running for some time, it is always best to set **Max Valve Open** to the desired modulation max range. Setting this to an appropriate max scale will not allow the valve to open to far and cause flooding, due to large valve capacity ranges, PID response times, and evaporator coil design. This also acts as a safety feature if a failed sensor has occurred, giving false superheat readings. Warmer ambient conditions will affect this value, due to less subcooling/liquid quality performance, and may need to be adjusted accordingly.

Scale



The default x values are set at 0 (X1) – 1000(X2) and y values are set at psi range of suction pressure transducer. This wide range of values gives more system accuracy for fine tuning the suction pressure transducer, as well as using an ***Offset*** if needed.
AI SCALING*:* Scaling is only for a 4-20mA sensor!

Parameters dE and Advanced

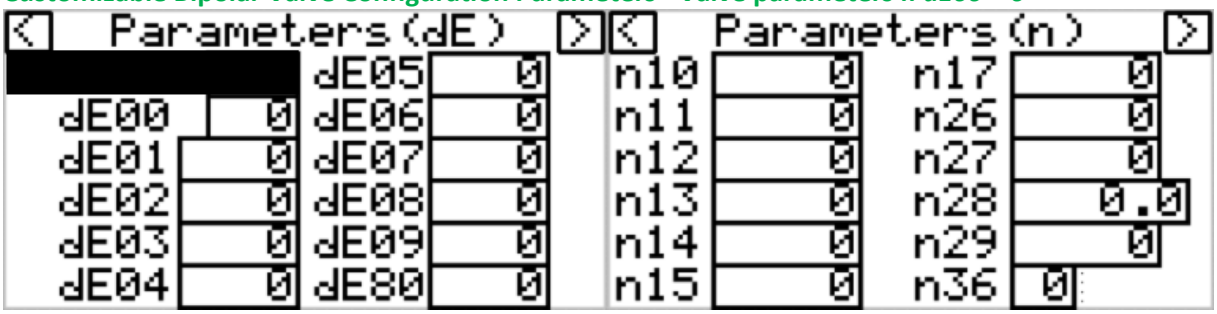


Refrigerant Type

Refrigerant	RefTyp Selection

Refrigerant	RefTyp Selection
R22	0
R134a	1
R404A	2
R407C	3
R410A	4
R407A	5
R407F	6
R290	7
R507A	8
R717	9
R723	10
R1234ze	11
R744	12
R448A	13
R427A	14
R450 (N13)	15
R513A	16
R449A	17
R1234yf	18
R454B	19
R454C	20
R455A	21
R434A	22
R442A	23
R32	24
R452B	25
R452A	26
R515b	255

Customizable Bipolar Valve Configuration Parameters - Valve parameters if *dE00 = 0*



Valve Type Settings (Alco / Danfoss Colibri ETS)

Alco EX4-8 and Danfoss Colibri Expansion Valve ETS12C – ETS100C has been fully tested with the Sensori platform. *See Modicon M172 Driver Manual for other valve types and settings*. Other valve types have not been tested by Oxford Sensori Platform.

dE00=0: The valve parameters **dE01…n40** are customizable. Refer to *Customizable Bipolar Valve Configuration Parameters, page 69 of Modicon M172 Driver Manual*.

dE00≠0 (unused dE00 values are reserved): The Preconfigure Values will be used. See Table Listed below (*next page*).

For all other valve types not listed in table below, refer to Preconfigured Bipolar Valve Configuration Parameters (see *Modicon M172 Electronic Expansion Valve Driver, Preconfigured Valves Parameters Guide*).

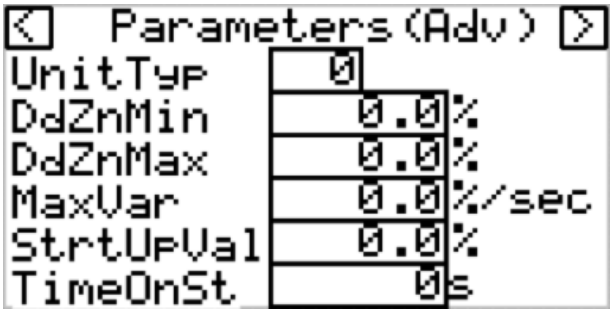
NOTE: Valves may need additional settings depending on wire length, power supply, or erratic valve response time PID to avoid step loss and proper closure. For Additional settings see "*VEV Post Control*" setpoints, valve current settings (dE03, dE04 can only be adjusted when dE00=0), current *Boost Mode* (*n27-n29*), and Max Variation Out.

LABEL	Parker-Sporlan				Emerson-ALCO			Danfoss			
	SER	SERI	SERI	SEHI	EX			ETS			
	AA, B, C, D	F, G, J, K	L	175, 400	4, 5, 6	7	8	12.5, 25, 50	100	250, 400	12C, 24C, 50C, 100C
dE00	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
dE01	200				500	210	500	300			240
dE02	2500			6386	750	1600	2600	2625	3530	3810	600
dE03	0				100			263	353	160	6
dE04	90	150		120	500	750	800	100			800
dE05	100			75	13	8	6	52			10
dE06	0				100	250	500	100			0
dE07	0										2
dE08	100										
dE09	0		50	0							
dE80	0		10	0							
n10	25			0							
n11	100			0							
n12...n15	0										
n16	1										
n17	0										
n18	0			1							
n19	3072										
n20	256										
n21	50										

LABEL	ADDRESS Valve 1	ADDRESS Valve 2	DATA TYPE	R/W	CPL	RESET	DESCRIPTION	RANGE	DEFAULT	U.M.
dE01	15801	16001	UINT	R/W	-	-	Maximum speed. Defines the maximum valve motor speed to allow step precision and integrity.	0...999	200	Steps/s
dE02	15802	16002	UINT	R/W	-	-	Full opening. Defines the maximum number of valve steps. The total travel refers to the FULL STEP mode (*dE07*=0). The valve opening is complete when this value is reached.	0...9990	2500	Steps
dE03	15803	16003	UINT	R/W	-	-	Extra movement in full closure. Defines the number of extra valve steps beyond the limit switch to allow a correct total closure. A total closure command implies the valve positioned to zero and a further number of steps *dE03*.	0...999	0	Steps
dE04	15804	16004	INT	R/W	-1	-	Winding maximum current. Defines the maximum current per phase utilized by the valve (maximum torque). Negative current value: the maximum current is set to the value with no sign (absolute) *dE04* with an extra 50% with the valve movement command (starting or end point) within 5% of total opening, to a value equal to the absolute value of *dE04* for the other movements.	-560 ... 850	90	mA
dE05	15805	16005	UINT	R	-	-	Reserved	0...999	100	Ohm
dE06	15806	16006	UINT	R/W	-	-	Winding holding current. Defines the phase circulating current in the valve stop condition (minimum torque).	0...850	0	mA
dE07	15807	16007	UINT	R/W	-	-	Type of stepper motor control. Defines the driving modes: • 0: FULL STEP • 1: HALF STEP • 2: MICRO STEP For more details, refer to the technical documentation of the electronic valve.	0...2	0	Num
dE08	15808	16008	UINT	R/W	-	-	Duty cycle. In the case of valve superheat, reduce the enabling duty cycle to allow it to cool down.	0...100	100	%
dE09	15809	16009	UINT	R/W	-	-	Acceleration/deceleration Defines the acceleration/deceleration in motor start/stop. The time between one step and the next is reduced by *dE09* at each step until *dE01* is reached. If *dE09* = 0 acceleration is not applied.	0...999	0	ms/10
dE80	15810	16010	UINT	R/W	-	-	Minimum motor speed for acceleration/ deceleration To be modified only if `dE09` >0	0...999	0	Steps/s
n10	15811	16011	UINT	R/W	-	-	Pause time.	0...999	25	ms
n11	15812	16012	UINT	R/W	-	-	Extra movement in full closure every `n15` hours working.	0...9990	100	Steps
n12	15813	16013	UINT	R/W	-	-	Change direction counter limit.	0...9990	0	Num

LABEL	ADDRESS Valve 1	ADDRESS Valve 2	DATA TYPE	R/W	CPL	RESET	DESCRIPTION	RANGE	DEFAULT	U.M.
n13	15814	16014	UINT	R/W	-	-	Extra movement in full opening. Related to bit 7 of Diagnostic Parameters, page 64.	0…9990	0	Steps
n14	15815	16015	UINT	R/W	-	-	Duty cycle period of activation/deactivation.	0…9990	0	s/10
n15	15816	16016	UINT	R/W	-	-	Period of periodical synchronization. • 0 = Function is disabled	0…9990	0	Hours
n16	15817	16017	UINT	R	-	-	Unipolar/Bipolar valve selection. • 1 = Bipolar • 2 = Unipolar	1…2	1	Num
n17	15818	16018	UINT	R/W	-	-	Maximum speed in emergency closing. If set at 0, referred value is dE01	0…999	0	Steps/s
n18	15819	16019	UINT	R	-	-	Reserved	0…1	0	Num
n19	15820	16020	UINT	R/W	-	-	Reserved	0…4095	3072	Num
n20	15821	16021	UINT	R/W	-	-	Reserved	0…2047	256	Num
n21	15822	16022	UINT	R/W	-	-	Reserved	0…512	50	Num
n22	15823	16023	UINT	R/W	-	-	Reserved	0…512	288	Num
n23	15824	16024	UINT	R/W	-	-	Reserved	0…2047	1296	Num
n24	15825	16025	UINT	R/W	-	-	Reserved	0…4095	2562	Num
n25	15826	16026	UINT	R/W	-	-	Reserved	0…4095	240	Num
n26	15827	16027	UINT	R/W	-	-	Periodical override mode: • 0=after n15 period with *Open_at_wr* = 0 • 1=after n15 period)	0…1	0	Flag
n27	15828	16028	UINT	R/W	-	-	Winding maximum current during boosting phase.	0…850	0	mA
n28	15829	16029	UINT	R/W	-	-	Boosting windows.	0…1000	0	‰
n29	15830	16030	UINT	R/W	-	-	Boosting mode: • 0=no • 1=open • 2=close • 3=both	0…3	0	Num
n30	15831	16031	UINT	R/W	-	-	Emergency Opening percentage.	0…1000	0	‰
n31	15832	16032	UINT	R/W	-	-	Behaviour on power fail: • 0 = no action, an alarm is generated Refer to bit 9 of Diagnostic Parameters, page 64 • 1 = close	0…1	1	Num
n32	15833	16033	UINT	R/W	-	-	Reserved	0…4	0	Num
n33	15834	16034	UINT	R/W	-	-	Reserved	0…4	0	Num
n34	15835	16035	UINT	R/W	-	-	Reserved	0…4	0	Num
n35	15836	16036	UINT	R/W	-	-	Reserved	0…4	0	Num
n36	15837	-	UINT	R/W	-	-	Number of Battery Backup modules. **NOTE:** Parameter value for valve 2 is not used. **NOTE:** This parameter is overwritten by *i_usi_batterynr*. This is a parameter of the driver, not of the valve. Input of the FB settings is preponderant respect to parameter value.	0…2	0	Num
n37	15838	16038	UINT	R/W	-	-	Valve energization time at startup.	0… 65535	25	ms

LABEL	ADDRESS Valve 1	ADDRESS Valve 2	DATA TYPE	R/W	CPL	RESET	DESCRIPTION	RANGE	DEFAULT	U.M.
n38	15839	16039	UINT	R/W	-	-	Valve energization time at stop.	0... 65535	25	ms
n39	15840	16040	UINT	R/W	-	-	Reserved	0... 65535	0	Num
n40	15841	16041	UINT	R/W	-	-	Reserved	0... 65535	0	Num



Unit Type - Type of unit to be controlled. If Unit Type = 0, parameters ***Superheat PID***, ***Enable SH Evo***, ***Superheat Deadband/DeadZone***, ***MOP PID***, ***Enable Dyn SP, Dyn Sp MxOf***, ***SP Inc Step***, ***SP Inc Time***, are used as input for regulation.

If uUnit type is different from 0 (Default 5), those parameters are automatically set (the used values are available on output) to cope with different type of unit or machine that can be found in HVAC or refrigeration:

E2_usiUnitType	Description of Unit
1	Ducted refrigeration unit and evaporation pressure quickly variable (for example step control)
2	Ducted refrigeration unit and evaporation pressure controlled (for example INVERTER control)
3	Refrigeration unit with on-board compressor
4	Refrigeration unit with on-board compressor and regenerative heat exchanger
5 Default	HVAC unit with plate heat exchanger (slow reaction)
6	HVAC unit with shell and tube heat exchanger (medium reaction)
7	HVAC unit with finned coil heat exchanger (moderately fast reaction)
8	HVAC unit with variable cooling capacity (fast reaction)
9	Perturbed HVAC unit (very fast reaction)

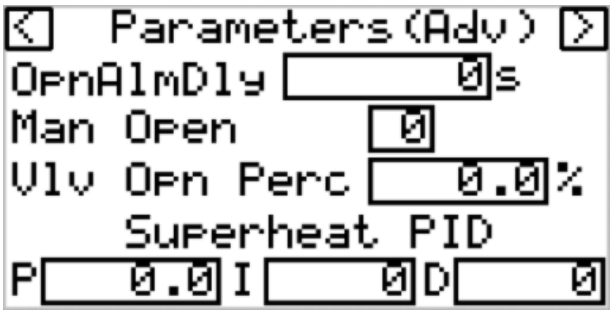
Dead Zone Min Value – Dead Zone minimum opening value (0% default)

Dead Zone Max Value – Dead Zone max opening value (100% default)

Max Variation Output –To limit quick variations of open value that can create oscillations in superheat and mechanics issues, it is possible to set a maximum variation of opening degree (%) per second. This value should be arranged depending on the mechanics of the electronic valve, for example it can be set less than maximum admitted speed for the EEV. If Max Variation Out = 0, The valve output is not limited in speed.

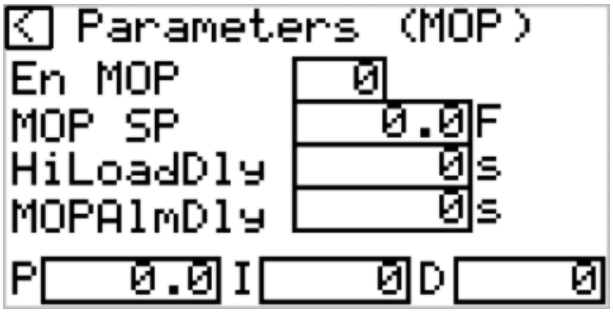
Start up Value / Time on Start – Active for initial valve command at startup. If **Start Up Value** setpoint differs from zero, the regulator fixes the opening value to **Start Up Value** for **Time On Start** seconds.

After this time is elapsed the regulation starts from this opening value, as for the super heat, as for the MOP (if enabled). If **Start up Value** is equal to zero, the regulator fixes the opening value to the opening value recorded before the stop and stored in EEPROM into the address **Last Value**. After the **Time On Start** time is elapsed, the regulation starts.



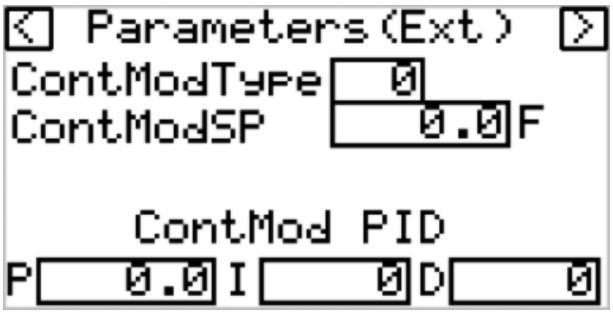
Open Alarm Delay - if **Manual Open** = FALSE and the valve stays open at maximum value for a time longer than **Open Alarm Delay** an alarm will occur. The alarm resets automatically if the output changes to a smaller value.

Manual Valve Open – Set to value of "1" to enable manual valve opening. Set **Valve Open Percent** to required open position when in manual mode.
Superheat P – Proportional band
I – Integral time constant(s)
D – Derivitive time constant(s)



MOP (Maximum Operating Pressure):
Set the **MOP Setpoint**, the maximum saturated vapor temperature. This is the set point of the **MOP PID**. When approaching this value, the MOP regulation starts to close the valve to come back to a safety operating mode. In this case, superheat control is abandoned but closing action is kept at minimum to start again to regulate when this load situation disappears.
High Load Delay – When The valve is initially started, for a time (**High Load Delay**)**,** MOP alarm is not monitored, and MOP control is not performed. Also, dynamic setpoint calculation is frozen if being used.
MOP Alarm Delay - If **MOP Setpoint** is passed for a longer time than **MOP Alarm Delay,** the function block puts the output to zero and the MOP alarm is triggered. This alarm is not monitored for a time (**High Load Delay**) after the initial start.

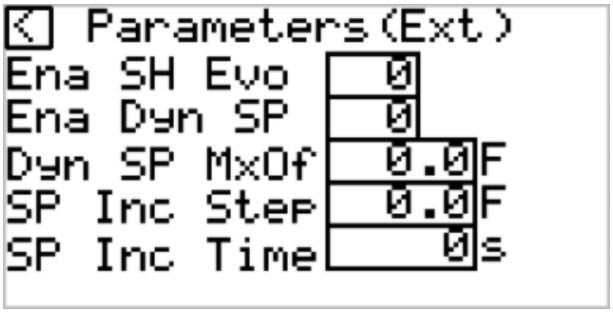
Extended Parameters



Continuous Modulation: *Used to control case Temperature for Sensori M172-18IO Case Management*

Continuous Modulation Type enables the continuous modulation regulation and permits us to set a **cool** PID regulation. Cool regulation means that the output increases as the process variable is below the setpoint. Set to 0 = disabled, 1= cool

The **Continuous Modulation Setpoint**. When approaching this value, the continuous modulation regulation starts to close the valve in order to maintain the setpoint while abandoning the superheat control. In that case, superheat control is abandoned but closing action is kept at minimum in order to start again to regulate superheat when this setpoint is far. This permits us to use the EEV to control the air temperature, while keeping superheat as low as possible and preventing at the same time to go beyond the MOP.



If **SH Evolution Enable** is set to "1", the superheat control is performed with an advanced algorithm, instead of the standard PID. *See Schneider's Manual (Modicon M172 Electronic Expansion Valve Driver*) for more information.

Dynamic Setpoint:

If **Dynamic SP Enable** = 0, the super heat set point is given directly to the super heat PID. If **Dynamic SP Enable** = 1 then dynamic set point calculation is enabled and the super heat set point is calculated with the following routine.

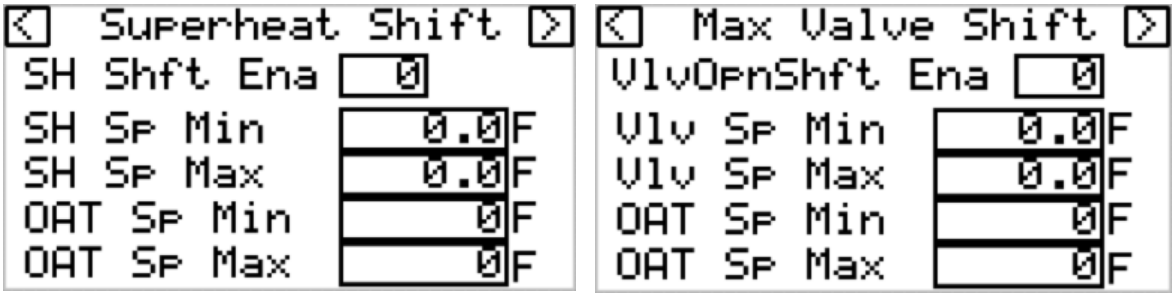
For a time, **High Load Delay**, after the initial valve start command: Superheat Setpoint Calculation = **Superheat SP** + **Dyn Setpoint Max Offset** (Dyn SP MxOf). After that, there is a dynamic set point calculation if superheat regulator is acting (Regulation Status = Superheat) with a timing of **Setpoint Increment Time** (SP Inc Time) Step time in the dynamical set point calculation):

If Superheat value > ***Superheat Setpoint***, Superheat calculation = Superheat Regulation Setpoint – **Setpoint Increment Step** (SP Inc Step).

If Superheat value < ***Superheat Setpoint***, Superheat calculation = Superheat Regulation Setpoint + ***Setpoint Increment Step*** (SP Inc Step).

Lastly, the calculated set point is forced to stay above ***Superheat Setpoint*** and under ***Superheat Setpoint*** + ***Dyn Setpoint Max Offset***.

Shift Setpoints



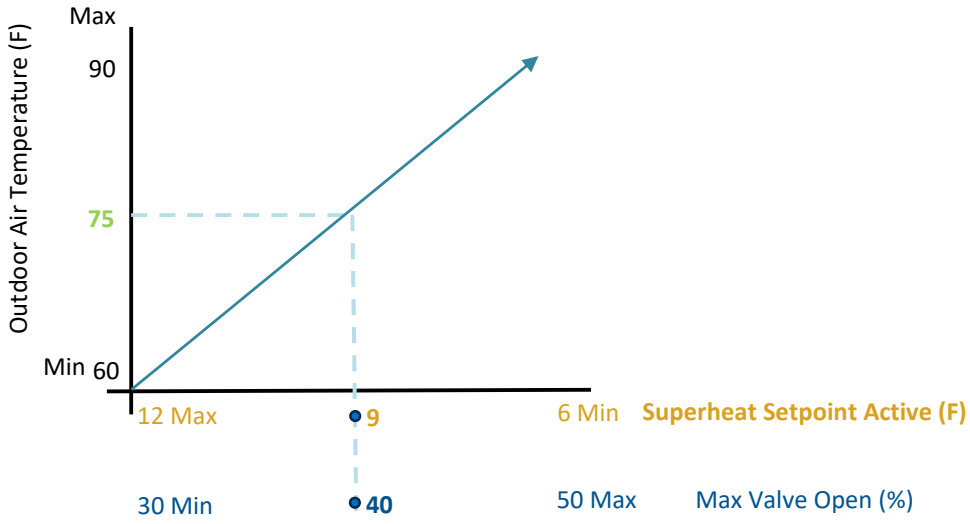
Superheat Shift:

Superheat Setpoint Shift based on Outdoor Temperature used in a linear scale, for setting superheat setpoint to improve case efficiency and minimize compressor superheat. As outdoor temperature increases, superheat setpoint will decrease.

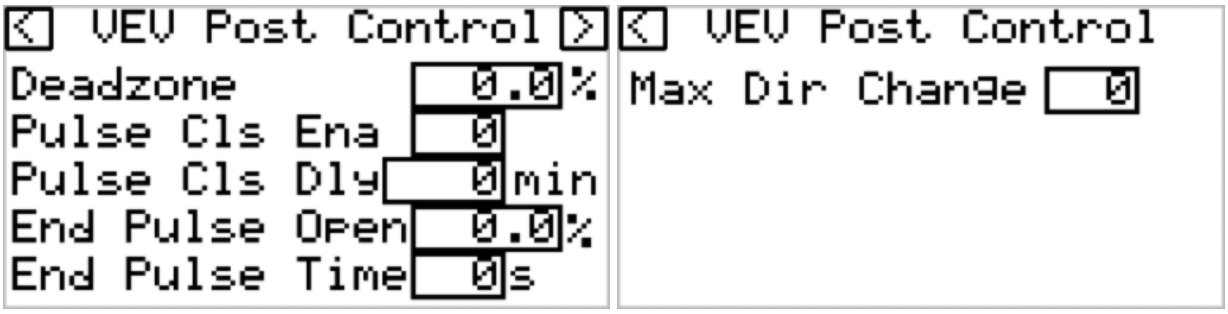
Set **Superheat Shift Enable** = 1 to enable this feature. Outdoor temperature MUST be enabled for this to work. Set the **Superheat Minimum and Maximum Setpoint** for superheat to float in a linear scale within the **Outdoor Air Temperature Min and Max Setpoint**.

Max Valve Shift:

Electronic Valve Max open Shift Setpoint. Max open setpoint of valve in a linear scale, for setting a max valve open based on Outdoor ambient when **Valve Open Shift Enable** = 1. This is used to prevent the Electronic Valve from opening to far during cooling and causing flooding due to "Lazy" coils and possible slow reaction time of valve. Max valve should always be set on cases as a safety, in case of sensor fails, to prevent cases from flooding. Set the **Valve Setpoint Min and Max** for floating max valve scale withing **Outdoor Air Temperature Min and Max Setpoint**.



On This Graph, Superheat Shift Active setpoint would be 9-degree F and Max Valve Open Shift Setpoint would be at 40%, at a 75-degree F ambient day.



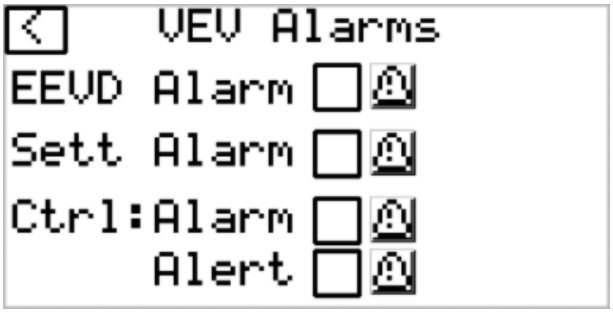
Deadzone is the output Dead Zone filter before a change is made to the valve percentage. For example, if the valve Dead Zone is set to 1, no output change will be sent to the valve while modulating 20.1,20.2,20.3… until 21, then will be sent.
Note: This is NOT to be mixed up with Superheat Dead Zone for PID control and is only available on Post Valve Control.

When **Pulse Close Enable** = 1, the valve will do an emergency quick close to ensure no valve step loss and proper closure after **Pulse Close Delay** has expired. Set **End Pulse Open** to a percentage that the valve will open to after the valve does a full closure, to ensure the operating system will recover and not pump down, for **End Pulse Time** seconds. It is only necessary to enable Pulse Close when the valve continues to run for long periods of time and does not lose the start command, such as a chiller for a curling rink on initial ice temperature pull down.

Max Direction Change > 0 and **Dead Zone** > 1% enables an algorithm which try to balance the number of change directions in valve steps. When set to 0, this function will be disabled. A direction counter tells how unbalanced the change of direction are (example. 5 means the valve made 5 opening steps more than closing. If negative, the closing action are more than the opening).

ALARMS

Indication that an alarm is present. Follow the image to find which alarm is present.



Refer to ***Modicon M172 Electronic Valve Driver Manual*** for more information on alarms and diagnostics

EEVD Alarms:

Diagnostic Parameter		Alarm	TM172EVEV••			Valve Driver Action	Rearm Condition
Bit	Description		1U	1B	2B		
0	Chip does not respond	Detected error on bipolar driver chip: chip does not respond.	No	Yes		Valve stops in current position	Automatic
1	Thermal shutdown	Detected error on bipolar driver chip: chip in fault protection	No	Yes		Moves the valve to the emergency position *n30*. Then any activity on the valve is stopped.	
2	Predriver detected error(*)						
3	Undervoltage Lockout(*)						
4	Reserved						
5	Overcurrent	Valve coil in short-circuit	Yes			Valve stops in current position	Manual: Alarm cause must be solved and a new "Activate and synchronize" command must be sent. Automatic rearm is managed by the AFB **EEVDAlarmMgmt**.
6	Reserved						
7	Max number of valve direction changing (only if *n12* > 0)	Max number of valve direction changing achieved	Yes			Moves the valve to the emergency position *n30*. Then any activity on the valve is stopped.	Automatic
8	Quantity of TM172EVEVBAT connected <> parameter *n36* value or TM172EVEVBAT exceeds charging time timeout	TM172EVEVBAT inoperable	Yes			Non-blocking alarm	Automatic
9	Power supply outage If TM172EVEVBAT connected and charged with enough energy	Power supply not detected	Yes			Movement towards the emergency position *n30* is executed only if *n31*=1 otherwise no action is done. If *n17*=0, the value of the "maximum speed in emergency closing" is equal to dE01. If *n17* >0 the movement towards the emergency position *n30* is done using *n17* speed.	Automatic
10	TM172EVEVBAT degraded due to: • the charge is too fast	TM172EVEVBAT degraded (*)	Yes			Non-blocking alarm	Automatic

Diagnostic Parameter		Alarm	TM172EVEV••			Valve Driver Action	Rearm Condition
Bit	Description		1U	1B	2B		
	• or if the last time that there has been an emergency movement followed by power fail, this has not been completed. The value has persisted in EEPROM so an emergency movement must be repeated successfully to cancel it.						
11	Configuration error *n16* value not compatible with TM172EVEV•• model. or: • Unipolar: *n32*, *n33*, *n34*, and *n35* value combination not allowed • Bipolar: *dE04*<0 and at least one of *n27*, *n28*, *n29* not 0	Configuration error	Yes			Valve stops in current position	Manual: Alarm cause must be solved and a new "Activate and synchronize" command must be sent. Automatic rearm is managed by the AFB `EEVDSettingsU` or `EEVDSettingsB` after sending new parameter values.
12	Disconnection on W1+ or W1-	Valve disconnected Detected only when valve is in synchronization phase. *See Note Below for synchronization*	Yes			Driver moves the EEV in any case. By default, the AFB **EEVDCntrl** considers this alarm as a stopping condition and try to move the valve to the "Alarm" position, where the EEV rest until the alarm disappear.	Manual: The alarm is detected and/or reset only in synchronization phase. If detected, it is maintained active until the next synchronization, as the disconnection is checked again and alarm is confirmed or reset. Automatic rearm is managed by the AFB `EEVDAlarmMgmt` that by default is set to periodically drive a synchronization phase to check again the alarm when present.
13	Disconnection on W2+ or W2-						
14	CAN not working, communication with master lost (not readable via CAN)	Loss of communication on CAN expansion bus Detected only after first connection with CAN master controller	Yes			Moves the valve to the emergency position *n30*. Then any activity on the valve is stopped.	Automatic
15	Reserved						
(*) Contact your local support.							

Note: Valve will do an extra Synchronization on the falling edge of the start command, and valve is at 0%. When this sync is done, the valve driver will look for alarms and valve "Not Ready" will appear. A valve disconnection error will ONLY appear when this sync is being done, and the valve is unplugged. Be sure to allow for proper valve closure after some time to ensure proper step count and valve ok.

*** Make sure to disconnect power to device when valve is being changed or wired! If an error occurs. A power reset is required to clear this alarm. ***

Settings Alarms:

Alarm bit	Alarm Cause	Effect
0	Communication interruption	Parameters list not sent
1	Parameters not set	Some parameters are not correctly set
2	File not found	Parameters list not loaded nor sent
3	Invalid file format: header not found	
4	Invalid file format: invalid values	
5	Invalid file format: EEV not found	
6	Invalid task	Parameters list not sent
7	Pointers to EEPROM not initialized (only if E2_ uidE00=0)	Parameters list not sent (only if E2_ uidE00=0), EEPROM parameter not updated
8...10	Reserved	–
11	Writing in EEPROM not possible (only if E2_ uidE00=0)	EEPROM parameter not updated
12	Parameters externally modified	Event to be externally managed
13...15	Reserved	–

Control Alarms/Alerts:

Bit	Alarm condition	Effect
0	Super heat PID parameter (Pb, Ti, Td) out of range	block disabled: `uiOut` goes to zero
1	MOP PID parameter (Pb, Ti, Td) out of range	
2	Continuous modulation PID parameter (Pb, Ti, Td) out of range	
3	Super heat dead band	
4	`E2_iSuperHeatSetp`, `E2_iMopSetp` or `iContModSetp` out of range	
5	`E2_uiPbAlarmValue` or `E2_uiExtAlarmValue` or `uiComAlarmValue` out of range	
6	`E2_uiTimeOnStart` or `E2_uiTimeOnStop` out of range	
7	`E2_uiValueOnDefrost` or `E2_uiValueOnStart` or `E2_uiValueOnStop` or `E2_uiExtLimitValue` or `E2_uiManualValue` out of range	
8	Dynamical set point parameters out of range	
9	Maximum open value or maximum output variation or dead zone values out of range	
10	`E2_usiUnitType` or `E2_usiContModType` out of range	
11	Saturated temperature probe out of range	
12	MOP alarm	
13	External alarm	block disabled: `uiOut` goes to fixed value
14	Communication alarm	block disabled: `uiOut` goes to zero
15	Error detected on EEPROM writing or incorrect task	block disabled: `uiOut` goes to fixed value

Bit	Alert condition	Effect
0	Super heat probe out of range	`iOut` goes to `uiPbAlarmValue`
1	Continuous modulation probe out of range	`iOut` goes to `uiPbAlarmValue`
2	Open alert	Alert the user of the open situation
3	`E2_uiTimeOnStop` changed runtime	The block runs with the old value
4	`E2_uiTimeOnStart` changed runtime	The block runs with the old value
5	`E2_uiMopAlarmDelay` changed runtime	The block runs with the old value
6	`E2_uiOpenAlarmDelay` changed runtime	The block runs with the old value
7	`E2_uiHighLoadDelay` changed runtime	The block runs with the old value
8	`E2_usiUnitType` changed runtime	Only alert (parameters are changed so)
9...15	Reserved	-