OENOREG+ WINE CONTROLLERS CONCISE MANUAL (59551-2)

CAUTION: Installation should be only performed by technically competent personnel. Local Regulations regarding electrical installation & safety must be observed.

1. OVERVIEW

The Oenoreg+ controllers from West have been designed with the following key features specifically for reliable temperature control during wine production to ensure the highest quality wine.

- Dual control outputs for Heating & Cooling via SPDT relays
- Individual activation of Heating and Cooling control
- Double set point with Heating and Cooling
- Optional Density measurement with management of alarm
- On/Off cycle Timer function
- 2 Display strategies
- Platinum probe input 100 Ohms at 0° C (Pt100 3 wires)
- Double digital display: Process Variable (Green) and Setpoint (Red)
- Remote and direct adjustment of the setpoint
- Correction of the measured value
- Alarm management and serial communication

2. FRONT FASCIA

48 × 96 mm – 1/8 DIN

48 × 48 mm – 1/16 DIN

Heat circuit

Cool circuit

LED for TIMER function

Output LED - Heat (up) or Cool (down)

- Two 4-Digit Displays

The Green top display shows the Process Variable
The Red bottom display shows the desired Setpoint.
When using double Setpoint, the Setpoint for heating and cooling are alternated in the display, with the matching LED illuminated.

- Three LED (light emitting diode) mode indicator lights.

The Heat LED is ON when the heating circuit active.
The Heat LED flashes (double Setpoint mode only) when the heating circuit is activated, and the heat Setpoint is shown as the lower Red alternates.

The Cool LED is ON when the cooling circuit is active.
The Cool LED flashes (double Setpoint mode only) when the cooling circuit is activated, and the Cool Setpoint is shown as the lower Red alternates.

The central Timer LED is ON when timer function is active.

- Two red LED output indicator arrow lights.

The up arrow ▲ shows that the relay output for heating is ON.
The down arrow ▼ shows that the relay output for cooling is ON.

- An operator keypad with 4 function switches

Heat switch: Press & hold for 2 secs to activate or deactivate the heating circuit.

Cool switch: Press & hold for 2 secs to activate or deactivate the cooling circuit.

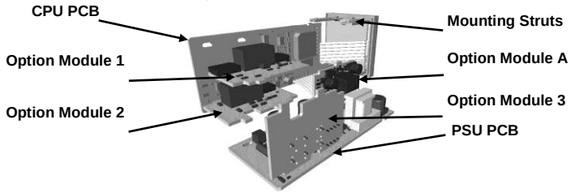
Density Measurement: If this option is fitted briefly press both & together to display the density measurement.

3. INSTALLATION

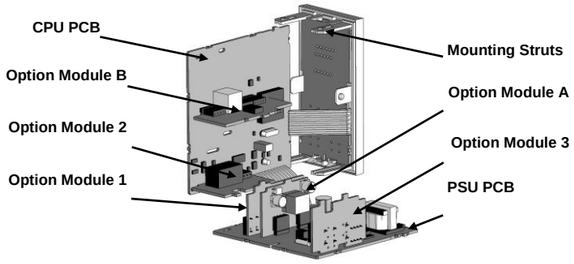
The models covered by this manual have two different DIN case sizes *(refer to section 12)*. Some installation details vary between models. These differences have been clearly shown.

Installing Option Modules

1/16 DIN Size Instruments



1/8 DIN Size Instruments



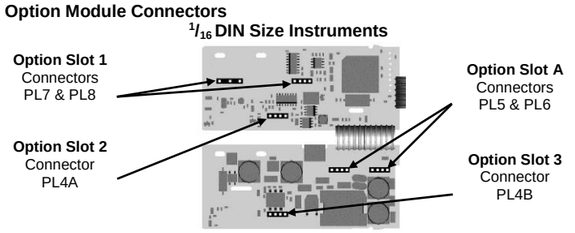
To access modules 1, A or B, first detach the PSU and CPU boards from the front by lifting first the upper, and then lower mounting struts. Gently separate the boards.

a. Plug the required option modules into the correct connectors, as shown below.
b. Locate the module tongues in the corresponding slot on the opposite board.
c. Hold the main boards together while relocating back on the mounting struts.
d. Replace the instrument by aligning the CPU and PSU boards with their guides in the housing, then slowly push the instrument back into position.

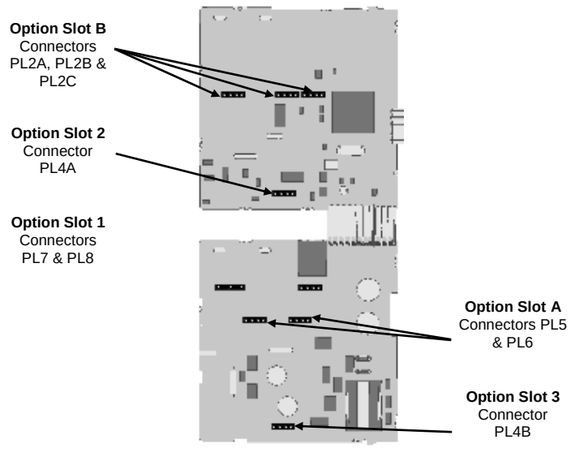
Note: Option modules are automatically detected at power up.

Option Module Connectors

1/16 DIN Size Instruments



1/8 DIN Size Instruments



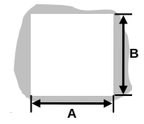
Note: The message **Goto ConF** is displayed on first power-up or hardware change. To enter conf mode use the unlock code, in section 4, and the key. You must scroll through all the configuration parameters, in section 5, to avoid this message on subsequent power-ups.

Panel-Mounting

The mounting panel must be rigid, and may be up to 6.0mm (0.25inch) thick. Cut-out sizes are:

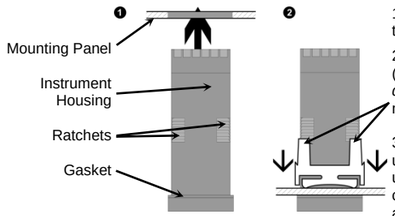
Cut-Out Dim A: 45mm

Cut-Out Dim B: 1/16 Din = 45mm; 1/8 Din = 92mm



Tolérance +0,5, -0,0mm

For *n* multiple instruments mounted side-by-side, cut-out A is 48*n*-4mm Din.



1. Insert instrument into the panel cut-out.
2. Hold front bezel firmly (*without pressing on display area*), and re-fit mounting clamp.
3. Push clamp forward, using a tool if necessary, until gasket is compressed and instrument held firmly in position.

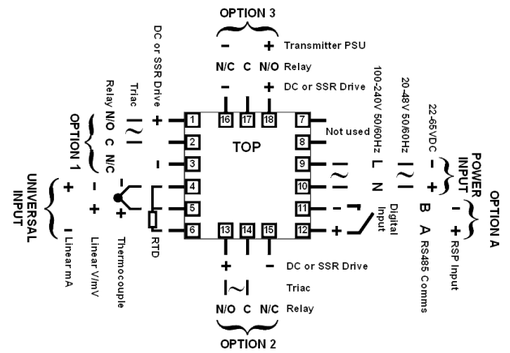
CAUTION: For an effective IP66 seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

Rear Terminal Wiring

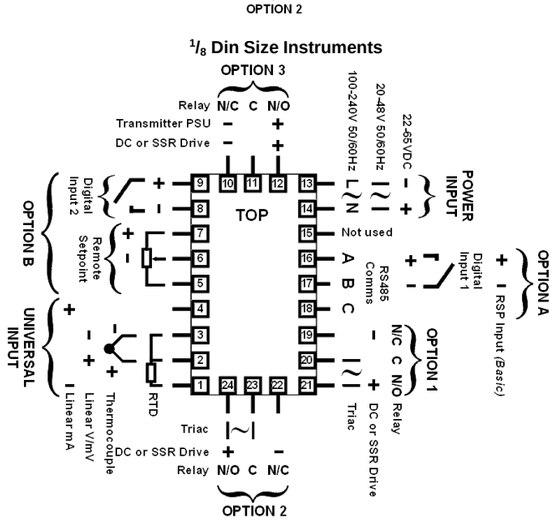
USE COPPER CONDUCTORS (EXCEPT FOR T/C INPUT)

Single Strand wire gauge: Max 1.2mm (18SWG)

1/16 Din Size Instruments



1/8 Din Size Instruments



The RSP (Option A) or Remote Setpoint Input (Option B) is used for the Wine Density reading.

These diagrams show all possible option combinations. The actual connections required depends on the exact model and options fitted.

CAUTION: Check information label on housing for correct operating voltage before connecting supply to Power Input
Fuse: 100 – 240V ac – 1amp anti-surge
24/48V ac/dc – 315mA anti-surge

4. SELECT MODE – SLCt

Select mode is used to access the configuration and operation menu functions.
It can be accessed at any time by holding down and pressing .
In select mode, press or to choose the required mode, press to enter. An unlock code is required to prevent unauthorised entry to Configuration, & Setup modes.
Press or to enter the unlock code, and then press to proceed.

Mode	Upper Display	Lower Display	Description	Default Unlock Codes
Operator	OPEr	SLCt	Normal operation	None
Set Up	SEtP	SLCt	Tailor settings to the application	10
Configuration	ConF	SLCt	Configure the instrument for use	20
Product Info	inFo	SLCt	Check manufacturing information	None
Timer mode	tMr1	SLCt	Timer	0

Note: The instrument will always return automatically to Operator mode if there is no key activity for 2 minutes.

5. CONFIGURATION MODE - ConF

First select Configuration mode from Select mode *(refer to section 4)*.
Press to scroll through the parameters, then press or to set the required value. Press to accept the change, otherwise parameter will revert to previous value.
To exit from Configuration mode, hold down and press to return to Select mode.
Note: Parameters displayed depends on how instrument has been configured. Refer to user guide (available from your supplier) for further details. Parameters marked * are repeated in Setup Mode.

Parameter	Lower Display	Upper Display	Adjustment range & Description	Default Value
Input Range/Type	inPt	*See following table for possible codes*		JC

Code	Input Type & Range	Code	Input Type & Range	Code	Input Type & Range
bC	B : 100 – 1824 ºC	LC	L : 0.0 – 537.7 ºC	P24F	PtRh20% vs. 40%: 32 - 3362 ºF
bF	B : 211 - 3315 ºF	LF	L : 32.0 – 999.9 ºF		
CC	C : 0 - 2320 ºC	nC	N : 0 - 1399 ºC	PtC	Pt100 : –199 - 800 ºC
CF	C : 32 - 4208 ºF	nF	N : 32 - 2551 ºF	PtF	Pt100 : –328 - 1472 ºF
JC	J : –200 - 1200 ºC	rC	R : 0 - 1759 ºC	Pt.C	Pt100: –128.8 - 537.7 ºC
JF	J : –328 - 2192 ºF	rF	R : 32 - 3198 ºF	Pt.F	Pt100: –199.9 - 999.9 ºF
J.C	J : –128,8 – 537.7 ºC	SC	S : 0 - 1762 ºC	0_20	0 - 20 mA DC
J.F	J : –199.9 – 999.9 ºF	SF	S : 32 - 3204 ºF	4_20	4 - 20 mA DC
KC	K : –240 - 1373 ºC	tC	T : –240 - 400 ºC	0_50	0 - 50 mV DC
KF	K : –400 - 2503 ºF	tF	T : –400 - 752 ºF	10_50	10 - 50 mV DC
K.C	K : –128.8 – 537.7 ºC	t.C	T : –128.8 – 400.0 ºC	0_5	0 - 5 V DC
K.F	K : –199.9 – 999.9 ºF	t.F	T : –199.9 – 752.0 ºF	1_5	1 - 5 V DC
LC	L : 0 - 762 ºC	P24C	PtRh20% vs. 40%: 0 - 1850 ºC	0_10	0 – 10 V DC
LF	L : 32 – 1403 ºF			2_10	2 – 10 V DC

Note: Decimal point shown in table indicates temperature resolution of 0.1°

Parameter	Lower Display	Upper Display	Adjustment range & Description	Default Value
Scale Range Upper Limit	ruL	Scale Range Lower Limit +100 to Range Maximum		Range max (Lin=1000)
Scale Range Lower Limit	rLL	Range Minimum to Scale Range Upper Limit -100		Range min (Linear=0)
Decimal point position	dPoS	0=xxxx, 1=xxx.x, 2=xx.xx, 3=x.xxx (non temperature range only)		1
Density Input Range (RSP)	r inP	0_20	0 to 20 mA DC input	0_10
		4_20	4 to 20 mA DC input	
		0_10	0 to 10 V DC input	
		2_10	2 to 10 V DC input	
		0_5	0 to 5 V DC input	
		1_5	1 to 5 V DC input	
		100	0 to 100mV DC input	*Available on full RSP (Slot B) only*
		Pot	Potentiometer (2KΩ minimum)	
RSP Upper Limit	rSPu	-1999 to 9999		Range max
RSP Lower Limit	rSPL	-1999 to 9999		Range min
RSP Offset	rSPo	Constrained within Scale Range Upper & Scale Range Lower limits		0
Decimal place	rSPP	0 to 3		0
Number of Setpoints	StyP	1 SP (single) or 2 SP (double)		1 SP
Alarm 1Type		P_Hi	Process High Alarm	P_Hi
		P_Lo	Process Low Alarm	
		dE	Deviation Alarm	
		bAnd	Band Alarm	
		nonE	No alarm	
High Alarm 1 value*		Range Minimum to Range Maximum		Range Max
Low Alarm 1 value*				Range Min
Dev. Alarm 1 value*	dAL1	+/- Span from setpoint in display units		5
Band Alarm 1 value*	bAL1	1 LSD to span from setpoint		5

Parameter	Lower	Upper	Adjustment Range & Description	Default Value
Alarm 1 Hysteresis*	AHY 1	1 LSD to full span in display units		1
Alarm 2 Type*	ALA2	P_H ,	Density high alarm	P_H ,
		P_Lo	Density low alarm	
High Alarm 2 value*		Range Minimum to Range		Range Max
Low Alarm 2 value*				Range Min
Alarm 2 Hysteresis*	AHY2	1 LSD to full span in display units		1
Loop Alarm	LAEn	d ,SA (disabled) or EnAb (enabled)		d ,SA
Loop Alarm Time	LAt ,	1 sec to 99 mins. 59secs		99.59
Alarm Inhibit	Inh ,	nonE	No alarms Inhibited	nonE
		ALA 1	Alarm 1 inhibited	
		ALA2	Alarm 2 inhibited	
		both	Alarm 1 and alarm 2 inhibited	
Output 1 Usage	USE 1	Pr ,	Primary Power	Pr ,
		SEc	Secondary Power	
		A 1_d	Alarm 1, Direct	
		A 1_r	Alarm 1, Reverse	
		A2_d	Alarm 2, Direct	
		A2_r	Alarm 2, Reverse	
		LP_d	Loop Alarm, Direct	
		LP_r	Loop Alarm, Reverse	
		Or_d	Logical Alarm 1 OR 2, Direct	
		Or_r	Logical Alarm 1 OR 2, Reverse	
		t ,MR 1	Output Timer function	
Linear Output 1 Range	tYP 1	0_5	0 to 5 V DC output	0_10
		0_10	0 to 10 V DC output	
		2_10	2 to 10 V DC output	
		0_20	0 to 20 mA DC output	
		4_20	4 to 20 mA DC output	
Retransmit Output 1 Scale maximum	ro 1H	-1999 to 9999 (display value at which output will be maximum)		Range max
Retransmit Output 1 Scale minimum	ro 1L	-1999 to 9999 (display value at which output will be minimum)		Range min
Output 2 Usage	USE2	As for output 1		Sec or Al2
Linear Output 2 Range	tYP2	As for output 1		0_10
Retransmit Output 2 Scale maximum	ro2H	-1999 to 9999 (display value at which output will be maximum)		Range max
Retransmit Output 2 Scale minimum	ro2L	-1999 to 9999 (display value at which output will be minimum)		Range min
Output 3 Usage	USE3	As for output 1		A 1_d
Linear Output 3 Range	tYP3	As for output 1		0_10
Retransmit Output 3 Scale maximum	ro3H	-1999 to 9999 (display value at which output will be maximum)		Range max
Retransmit Output 3 Scale minimum	ro3L	-1999 to 9999 (display value at which output will be minimum)		Range min
Display Strategy	d ,SP	1.2 *(refer to section 10)*		1
Serial Communications Protocol	Prot	rtbn	Modbus with no parity	
		rtbE	Modbus with Even Parity	
		rtbo	Modbus with Odd Parity	
Serial Communications Bit Rate	bAud	1.2	1.2 kbps	4.8
		2.4	2.4 kbps	
		4.8	4.8 kbps	
		9.6	9.6 kbps	
		19.2	19.2 kbps	
Comms Address	Addr	1 to 255 (Modbus)		1
Comms Write	CoEn	r_W	Read/Write	r_W
		r_O	Read only	
Lock code	CLoc	0 to 9999		20

6. SETUP MODE - SEtP

Note: Configuration must be completed before adjusting Setup parameters.
First select Setup mode from Select mode *(refer to section 4)*.
Press ❄ to scroll through the parameters,
then press △ or ▽ to set the required value.
To exit from Setup mode, hold down ❄ and press △ to return to Select mode.

Note: Parameters displayed depends on how instrument has been configured.

Parameter	Lower Display	Upper Display Adjustment Range & Description	Default Value
Input Filter Time Constant	F ,Lt	OFF or 0.5 to 100.0 secs	2.0
Process Variable Offset	OFFS	±Span of controller	0
Primary Power	PPoW	Current power levels *(read only)*	N/A
Secondary Power	SPoW		

Parameter	Lower Display	Upper Display Adjustment Range & Description	Default Value
Primary Proportional Band	Pb_P	Normally set at 0 for wine temperature applications	0
Secondary Proportional Band	Pb_S		
Automatic Reset (Integral Time)	ArSt	Appears only if Pb_P >0	5.00
Rate (Derivative Time)	rAtE	Appears only if Pb_P >0	1.15
Overlap/Deadband	OL	-20 to +20% of Primary and Secondary Proportional Band	0
Manual Reset (Bias)	b ,AS	0%*(-100% if dual control)* to 100%	25
Prin. & Sec. Differential ON/OFF	d ,FF	0.1% to 10.0% of input span (Entered as % of span)	0.5
Setpoint Upper Limit	SPuL	Current Setpoint to Range max	R/max
Setpoint Lower limit	SPLL	Range min to Current Setpoint	R/min
High Alarm 1 value	PhA 1	Range Minimum to Range Maximum	R/max
Low Alarm 1 value	PLA 1		R/min
Deviation Alarm 1 Value	dAL 1	±Span from SP in display units	5
Band Alarm 1 value	bAL 1	1 LSD to span from setpoint	5
Alarm 1 Hysteresis	AHY 1	1 LSD to full span in display units	1
High Alarm 2 value	PhA2	Range Minimum to Range Maximum	R/max
Low Alarm 2 value	PLA2		R/min
Alarm 2 Hysteresis	AHY2	1 LSD to full span in display units	1
Heating Setpoint value	SP-H	High limit to the low limit of the range	Range Min
Cooling Setpoint value	SP-C		Range Max
SP Ramp Rate Value	rP	1 to 9999 units/hour or Off (blank)	Off
Setpoint Value	SP	Scale range upper to lower limits	Scale Range Minimum
Setup Lock Code	SLoc	0 to 9999	10
Actual SP Value	SPrP	Instantaneous value of the ramping Setpoint *Read only*	

7. TIMER MODE

First select Timer mode from Select mode *(refer to section 4)*.
Press ❄ to scroll through the different parameters and △ or ▽ to set the required value.
To exit from Timer mode, hold down ❄ and press △ to return to Select mode.
The Timer LED is ON when the timer function is active, and OFF when the timer function is inactive.
The timer output is ON during time T1 (durE) and OFF during time T2 (Int).

Parameter	Lower Display	Adjustment range & Description	Default Value
Timer Function	durE	ON time value (T1) (0 to 1999) minutes	0
	Int	OFF time value (T2) (0 to 1999) minutes	0
Lock Code	tLoc	0 to 9999	0

Briefly press △ and ▽ together to activate or deactivate the timer.
Whilst activated the timer will cycle between ON and OFF.

8. PRODUCT INFORMATION MODE - InFo

First select Product information mode from Select mode *(refer to section 4)*.
Press ❄ to view each parameter. To exit from Product Information mode, hold down ❄ and press △ to return to Select mode.
Note: These parameters are all read only.

Parameter	Lower Display	Upper Display	Description
Input type	In_ 1	Un ,	Universal input
Option 1 module type fitted	OPn 1	nonE	No option fitted
		rLY	Relay output
		SSr	SSR drive output
		tr ,	Triac output
		L in	Linear DC voltage / current output
Option 2 module type fitted	OPn2	As Option 1	
Option 3 module type fitted	OPn3	As Option 1	
Auxiliary Option A module type fitted	OPnA	nonE	No option fitted
		r485	RS485 communications
		rSP ,	Density Input
Auxiliary Option B module type fitted	OPnb	nonE	No option fitted
		rSP ,	Density Input
Firmware type	FtyP	Value displayed is firmware type number	
Firmware issue	ISS	Value displayed is firmware issue number	
Product Revision Level	PrL	Value displayed is Product Revision level	
Date of manufacture	dAtE	Manufacturing date code *(mmyy)*	
Serial number 1	Sn 1	First four digits of serial number	
Serial number 2	Sn2	Middle four digits of serial number	
Serial number 3	Sn3	Last four digits of serial number	

9. MESSAGES & ERROR INDICATIONS

These messages indicate that an error has occurred or there is a problem with the Process Variable input signal or its wiring.
Caution: Do not continue with the process until the issue is resolved.

Parameter	Upper Display	Lower Display	Description
Instrument parameters are in default conditions	Goto	Conf	Configuration & Setup required. This screen is seen at first turn on, or if hardware configuration has been changed. Press ❄ to enter the Configuration Mode, next press △ or ▽ to enter the unlock code number, then press ❄ to proceed
Input Over Range	CHHJ	Normal	Process Variable input > 5% over-range
Input Under Range	CLLJ	Normal	Process Variable input > 5% under-range
Input Sensor Break	OPEN	Normal	Break detected in Process Variable input sensor or wiring
RSP Over Range	Normal	CHHJ **	RSP input over-range ** *also seen wherever RSP value would be displayed*
RSP Under Range	Normal	CLLJ **	RSP input under-range
RSP Break	Normal	OPEN **	Break detected in RSP input signal
Option 1 Error	Err	OPn 1	Option 1 module fault
Option 2 Error		OPn2	Option 2 module fault
Option 3 Error		OPn3	Option 3 module fault
Option A Error		OPnA	Option A module fault or RSP in both A & B
Option B Error		OPnb	Option B module fault

10. OPERATOR MODE - OPtr

This mode is entered at power on, or accessed from Select mode *(see section 2)*.
Note: All Configuration mode and Setup mode parameters must be set as required before starting normal operations

Upper Display	Lower Display	Display Strategy (d ,SP)	Description
PV Value	Active SP Value	1	PV and target value of selected SP
(Blank)	*(Blank)*	2	Both displays off (*blank*)

11. SERIAL COMMUNICATIONS

Refer to the full user guide (available from your supplier) for details.

12. SPECIFICATIONS

UNIVERSAL INPUT

Thermocouple Calibration: ±0.1% of full range, ±1LSD (±1°C for Thermocouple CJC). BS4937, NBS125 & IEC584.
PT100 Calibration: ±0.1% of full range, ±1LSD. BS1904 & DIN43760 *(0.00385Ω/Ω/°C)*.
DC Calibration: ±0.1% of full range, ±1LSD.
Sampling Rate: 4 per second.
Impedance: >10MΩ resistive, except DC mA (5Ω) and V (47kΩ).
Sensor Break Detection: Thermocouple, RTD, 4 to 20 mA, 2 to 10V and 1 to 5V ranges only. *Control outputs turn off.*
Isolation: Isolated from all outputs (except SSR driver).
Universal input must not be connected to operator accessible circuits if relay outputs are connected to a hazardous voltage source. Supplementary insulation or input grounding would then be required.

REMOTE SIGNAL INPUT (RSP) - WINE DENSITY

Accuracy: ±0.25% of input range ±1 LSD.
Sampling Rate: 4 per second.
Sensor Break Detection: 4 to 20 mA, 2 to 10V and 1 to 5V ranges only. *Control outputs turn off if RSP is active.*
Isolation: Slot A - Basic isolation, Slot B - Reinforced safety isolation from other inputs and outputs.

OUTPUTS

Relay
Contact Type & Rating: Single pole double throw (SPDT); 2A resistive at 120/240VAC.
Lifetime: >500,000 operations at rated voltage/current.
Isolation: Basic Isolation from universal input and SSR outputs.

SSR Driver
Drive Capability: SSR drive voltage >10V into 500Ω min.
Isolation: Not isolated from universal input or other SSR driver outputs.

Triac
Operating Voltage:
Current Rating: 0.01 to 1A (full cycle rms on-state @ 25°C); derates linearly above 40°C to 0.5A @ 80°C.
Isolation: Reinforced safety isolation from inputs and other outputs.

Linear DC
Resolution: 8 bits in 250mS (10 bits in 1s typical, >10 bits in >1s typical).
Isolation: Reinforced safety isolation from inputs and other outputs.

Transmitter PSU
Power Rating: 20 to 28V DC (24V nominal) into 910Ω minimum resistance.
Isolation: Reinforced safety isolation from inputs and other outputs.

SERIAL COMMUNICATIONS

Physical: RS485 at 1200, 2400, 4800, 9600 or 19200 bps.
Protocols: Modbus
Isolation: Reinforced safety isolation from all inputs and outputs.

OPERATING CONDITIONS (FOR INDOOR USE)

Ambient Temperature: 0°C to 55°C (Operating), –20°C to 80°C (Storage).
Relative Humidity: 20% to 95% non-condensing.
Altitude <2000m
Supply Voltage and Power: 100 to 240VAC ±10%, 50/60Hz, 7.5VA (*for mains powered versions*), or 20 to 48VAC 50/60Hz 7.5VA or 22 to 65VDC 5W (*for low voltage versions*).

ENVIRONMENTAL

Standards: CE, UL, cUL & CSA.
EMI: EN61326-1:2013.
Safety Considerations: UL61010-1 & CSA 22.2 No 1010.1. Pollution Degree 2, Installation Category II.
Front Panel Sealing: To IP66 (IP20 behind the panel).

PHYSICAL

Front Bezel Size: $^1/_{16}$ DIN = 48 x 48mm, $^1/_8$ DIN = 96 x 48mm
Depth Behind Panel: $^1/_{16}$ DIN (48x48) = 110mm. $^1/_8$ (48x96) = 100mm.
Weight: 0.21kg maximum.

SUPPLEMENTARY INFORMATION FOR CSA

-Compliance shall not be impaired when fitted to the final installation.
-Designed to offer a minimum of Basic Insulation only.
-The body responsible for the installation is to ensure that supplementary insulation suitable for Installation Category II is achieved when fully installed.
-To avoid possible hazards, accessible conductive parts of the final installation should be protectively earthed in accordance with UL61010 for Class 1 Equipment.
-Output wiring should be within a Protectively Earthed cabinet.
Sensor sheaths should be bonded to protective earth or not be accessible.
-Live parts should not be accessible without the use of a tool.
-When fitted to the final installation, an IEC/CSA APPROVED disconnecting device should be used to disconnect both LINE and NEUTRAL conductors simultaneously.
-A clear instruction shall be provided not to position the equipment so that it is difficult to operate the disconnecting device.