1/16 - 1/8 - 1/4 DIN VMD CONTROLLERS CONCISE PRODUCT MANUAL (59377-1)

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

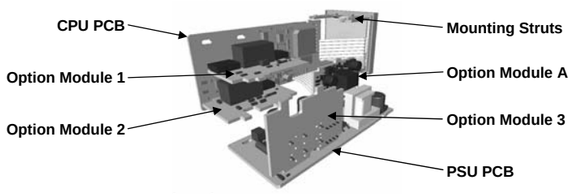
1. INSTALLATION

The models covered by this manual have three different DIN case sizes *(refer to section 10).* Some installation details vary between models. These differences have been clearly shown.

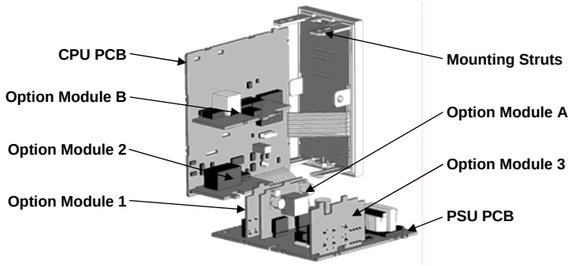
Note: The functions described in sections 2 thru 9 are common to all models.

Installing Option Modules

1/16 Din Size Instruments



1/8 & 1/4 Din Size Instruments



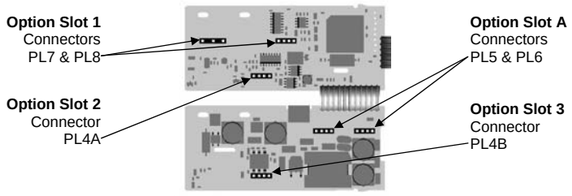
To access modules 1, A or B, first detach the PSU and CPU boards from the front by lifting first the upper, and then lower mounting struts. Gently separate the boards.

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.

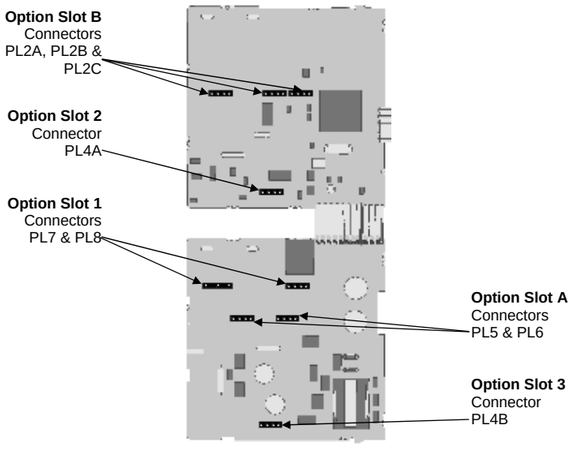
Note: Option modules are automatically detected at power up.

Option Module Connectors

1/16 Din Size Instruments



1/8 & 1/4 Din Size Instruments

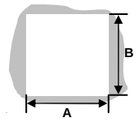


Panel-Mounting

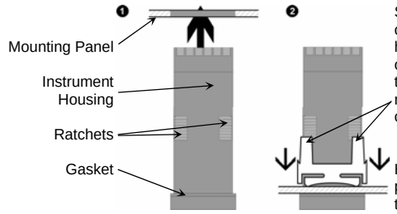
The mounting panel must be rigid, and may be up to 6.0mm (0.25inch) thick. Cut-out sizes are:

Cut-Out Dim A	Cut-Out Dim B
1/16 & 1/8 Din = 45mm	1/16 Din = 45mm
1/4 Din = 92mm	1/8 & 1/4 Din = 92mm

For *n* multiple instruments mounted side-by-side, cut-out A is 48*n*-4mm (1/16 & 1/8 Din) or 96*n*-4mm (1/4 Din)



Tolerance +0.5, -0.0mm



Slide mounting clamp over the instrument housing towards rear face of mounting panel until the tongues engage in ratchets and instrument is clamped in position.

Hold instrument firmly in position (apply pressure to bezel only)

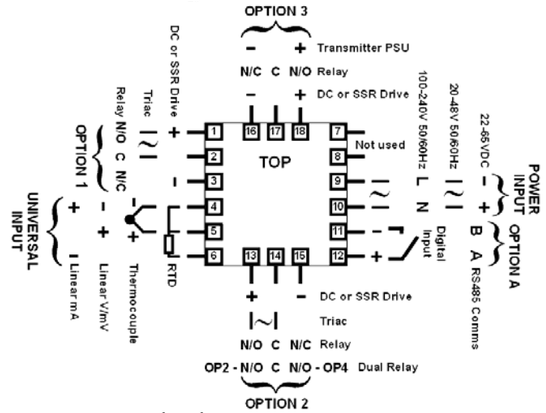
CAUTION: Do not remove the panel gasket; it is a seal against dust and moisture.

Rear Terminal Wiring

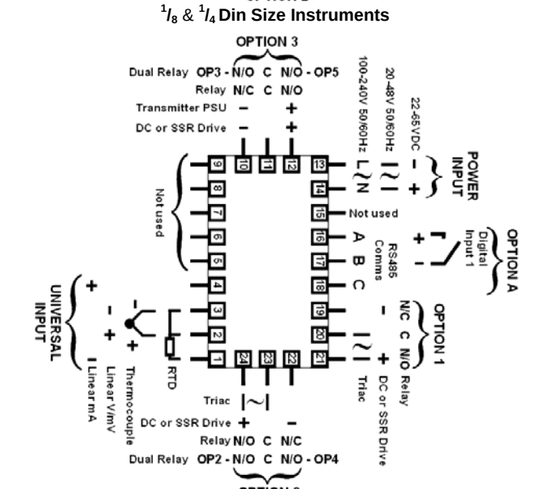
USE COPPER CONDUCTORS (EXCEPT FOR T/C INPUT)

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

1/16 Din Size Instruments



1/8 & 1/4 Din Size Instruments



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

Note: At first power-up the message `Goto Conf` is displayed, as described in section 7 of this manual. Access to other menus is denied until configuration mode is completed

2. SELECT MODE

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	`OPtr`	`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
Auto-Tuning	`Atun`	`SLCt`	Invoke Pre-Tune or Self-Tune	`0`

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

3. CONFIGURATION MODE

First select Configuration mode from Select mode *(refer to section 2).*
Press ↺ to scroll through the parameters, then press △ or ▽ to set the required value. Press AUTO MAN 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 ranges only)		`1`
Primary Output Control Action	`CtrL`	`rEu`	Reverse Acting	`rEu`
		`dir`	Direct Acting	
Motor Travel Time	`tr`	5 secs to 5 mins		`1.00`
Alarm 1Type	`AL1 1`	`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*	`PhA1`	Range Minimum to Range Maximum in display units		Range Max
Low Alarm 1 value*	`PLA1`			Range Min
Band Alarm 1 value*	`bAL1`	1 LSD to span from setpoint in display units		`5`
Dev. Alarm 1 value*	`dAL1`	+/- Span from setpoint in display units		`5`
Alarm 1 Hysteresis*	`AHY1`	1 LSD to full span in display units		`1`
Alarm 2 Type*	`AL2`	Options as for alarm 1		`P_Lo`
High Alarm 2 value*	`PhA2`			Range Max
Low Alarm 2 value*	`PLA2`			Range Min
Band Alarm 2 value*	`bAL2`			`5`

Parameter	Lower Display	Upper Display	Adjustment range & Description	Default Value
Dev. Alarm 2 Value*	`dAL2`	Options as for alarm 1		`5`
Alarm 2 Hysteresis*	`AHY2`			`1`
Loop Alarm	`LAEn`	`diSA` (disabled) or `EnAb` (enabled)		`diSA`
Alarm Inhibit	`Inh1`	`nonE`	No alarms Inhibited	`nonE`
		`AL1 1`	Alarm 1 inhibited	
		`AL12`	Alarm 2 inhibited	
		`both`	Alarm 1 and alarm 2 inhibited	
Output 1 Usage	`USE1`	`OPn`	Valve Open	`OPn`
		`CLS`	Valve Close	
		`A1_d`	Alarm 1, Direct	
		`A1_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	
		`Ad_d`	Logical Alarm 1 AND 2, Direct	
		`Ad_r`	Logical Alarm 1 AND 2, Reverse	
		`rEtS`	Retransmit SP Output	
		`rEtP`	Retransmit PV Output	
Linear Output 1 Range	`tyP1`	`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	`ro1H`	-1999 to 9999 (display value at which output will be maximum)		Range max
Retransmit Output 1 Scale minimum	`ro1L`	-1999 to 9999 (display value at which output will be minimum)		Range min
Output 2 Usage	`USE2`	As for output 1		`CLS`
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		`A1_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
Output 4 Usage	`USE4`	`OPn`	Valve Open	`A1_d`
		`CLS`	Valve Close	
		`A1_d`	Alarm 1, Direct	
		`A1_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	
		`Ad_d`	Logical Alarm 1 AND 2, Direct	
		`Ad_r`	Logical Alarm 1 AND 2, Reverse	
Output 5 Usage	`USE5`	As for output 4		`A1_d`
Display Strategy	`diSP`	`1`, `2`, `3`, `4`, `5`, `6` or `7` *(refer to section 8)*		`1`
Serial Communications Protocol	`Prot`	`ASCI`	ASCII	`Modbn`
		`Modn`	Modbus with no parity	
		`ModE`	Modbus with Even Parity	
		`Modo`	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`	1 to 255 (Modbus), 1 to 99 (ASCII)	`1`
Comms Write	`CoEn`	`r_Wd`	Read/Write	`r_Wd`
		`r_O`	Read only	
Auxiliary Option A Usage	`AiPA`	`rSP`	Remote Setpoint	`P_`
		`P_in`	Valve Position Indication	

Parameter	Lower Display	Upper Display	Adjustment range & Description	Default Value
Auxiliary Option B Usage	AuPb	rSP	Remote Setpoint	P,
		P in	Valve Position Indication	
Digital Input 1 Usage	d iG,	d iS1	Setpoint 1 / Setpoint 2 select*	d iS1
		d iAS	Automatic / Manual select	
Digital Input 2 Usage	d iG2	d iS1	Setpoint 1 / Setpoint 2 select*	d irS
		d iAS	Automatic / Manual select	
		d irS	Remote / Local setpoint select	
Remote Setpoint Input Range	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
Configuration Lock Code	CLoc	0 to 9999		20

Note: d iG2 has priority over d iG, if both are configured for the same usage. If d iG, or d iG2 =d iS1 the remote setpoint input is disabled.

4. SETUP MODE

Note: Configuration must be completed before adjusting Setup parameters.
First select Setup mode from Select mode *(refer to section 2)*. The MAN LED will light while in Setup mode. 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 iLt	OFF or 0.5 to 100.0 secs	2.0
Process Variable Offset	OFFS	±Span of controller	0
Primary Proportional Band	Pb_P	0.5% to 999.9% of input span	10.0
Automatic Reset (Integral Time)	ArSt	1 sec to 99 mins 59 secs	5.00
Rate (Derivative Time)	rAtE	00 secs to 99 mins 59 secs	0
Setpoint Upper Limit	SPuL	Current Setpoint to Range max	R/max
Setpoint Lower limit	SPLL	Range min to Current Setpoint	R/min
Minimum Motor On Time	ton	0.0 secs to (Motor Travel Time / 10) secs	1.0
Set Valve Open Position	PcUL	Valve Maximum Position Clamp	Aux R/max
Set Valve Closed Position	PcLL	Valve Minimum Position Clamp	Aux R/min
Valve Open Limit	P iUL	Valve Maximum Position	100
Valve Close Limit	P iLL	Valve Minimum Position	0
High Alarm 1 value	PhA1	Range Minimum to Range Maximum	R/max
Low Alarm 1 value	PLA1		R/min
Deviation Alarm 1 Value	dAL1	±Span from SP in display units	5
Band Alarm 1 value	bAL1	1 LSD to span from setpoint	5
Alarm 1 Hysteresis	AHY1	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
Deviation Alarm 2 Value	dAL2	±Span from SP in display units	5
Band Alarm 2 value	bAL2	1 LSD to span from setpoint	5
Alarm 2 Hysteresis	AHY2	1 LSD to full span in display units	1
Auto Pre-tune	APt	d iSA (disabled) or EnAb (enabled)	d iSA
Auto/manual Control selection	PoEn		
Setpoint Select shown in Operator Mode	SSEn		
Setpoint ramp adjustment shown in Operator Mode	SPr		
SP Ramp Rate Value	rP	1 to 9999 units/hour or Off (blank)	Off
Setpoint Value	SP	Scale range upper to lower limits. (when dual or remote setpoint options are used, SP is replaced by SP1 & SP2 or LSP - or = before the legend indicates the currently active SP)	Scale Range Minimum
Local Setpoint Value	_LSP		
Setpoint 1 Value	_SP1		
Setpoint 2 Value	_SP2		
Setup Lock Code	SLoc	0 to 9999	10

5. AUTOMATIC TUNING MODE

First select Automatic tuning mode from Select mode *(refer to section 2)*.
Press to scroll through the modes, then press or to set the required value.
To exit from Automatic tuning mode, hold down and press , to return to Select mode.
Pre-tune is a single-shot routine and is thus self-disengaging when complete.
If APt in Setup mode = EnAb, Pre-tune will attempt to run at every power up*.
Refer to the full user guide (available from your supplier) for details on controller tuning.

Parameter	Lower Display	Upper Display	Default Value
Pre-Tune	Ptun	On or OFF. Indication remains OFF if automatic tuning cannot be used at this time*	OFF
Self-Tune	Stun		
Tune Lock	tLoc	0 to 9999	0

Also, Pre-tune will not engage if setpoint is ramping, or the PV is less than 5% of input span from the setpoint.

6. PRODUCT INFORMATION MODE

First select Product information mode from Select mode *(refer to section 2)*.
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	OPn1	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	drLY	As Option 1 & Dual relay output
Option 3 module type fitted	OPn3	nonE	No option fitted
		rLY	Relay output
		drLY	Dual relay output
		SSr	SSR drive output
		L in	Linear DC voltage / current output
		dc24	Transmitter power supply
Auxiliary Option A module type fitted	OPnA	nonE	No option fitted
		r485	RS485 communications
		d iG,	Digital Input*
		rSP,	Remote Setpoint Input *(basic)**
Auxiliary Option B module type fitted	OPnb	nonE	No option fitted
		rSP,	Remote Setpoint Input *(full)* and Digital Input 2*
Firmware type	FLU	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	dOM	Manufacturing date code *(mmyy)*	
Serial number 1	Sn1	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	

7. 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
RSP Under Range	Normal	CLLJ **	RSP input under-range
RSP Break	Normal	OPEN **	Break detected in RSP input signal
Option 1 Error	Err	OPn1	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

*** also seen wherever RSP value would be displayed*

8. OPERATOR MODE

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.
Press to scroll through the parameters, then press or to set the required value.
Note: All Operator Mode parameters in Display strategy 6 are read only (see d iSP in configuration mode), they can only be adjusted via Setup mode.

Upper Display	Lower Display	Display Strategy and When Visible	Description
PV Value	Active SP Value	1, 2 & 7 *(initial screen)*	PV and target value of selected SP *Local Setpoints are adjustable in Strategy 2 & 7*
PV Value	Actual SP Value	3 & 6 *(initial screen)*	PV and actual value of selected SP (e.g. ramping SP value). *Read only*
PV Value	*(Blank)*	4 *(initial screen)*	Process variable only *Read only*
Active SP Value	*(Blank)*	5 *(initial screen)*	Target value of selected setpoint only. *Read only*
PV Value	Auxiliary Input Value	7	PV and value of Auxiliary Input selected (e.g. valve position)
SP Value	SP	1, 3, 4, 5 & 6 if digital input is not d iS1 and RSP not fitted	Target value of SP *Adjustable except in Strategy 6*
SP1 Value	_SP1	Digital input = d iS1. _ lit if active SP = SP1	Target value of SP1 *Adjustable except in Strategy 6*
SP2 Value	_SP2	Digital input = d iS1. _ lit if active SP = SP2	Target value of SP2 *Adjustable except in Strategy 6*
Local SP Value	_LSP	RSP fitted. _ or = lit if the active SP = LSP	Target value of local setpoint *Adjustable except in Strategy 6*
Remote SP Value	_rSP	RSP fitted. _ or = lit if the active SP = rSP	Target value of remote setpoint *Read only*
d iG, LSP or rSP	SPS	RSP is fitted, digital input is not d iS1 and SSEn is enabled in Setup mode	Selects local/remote active setpoint LSP = local SP, rSP = remote SP d iG, = selection via digital input (if configured). *Note: selecting LSP or rSP will override digital input, active SP indication changes to = Adjustable except in Strategy 6*
Actual SP Value	SPrP	rP is not blank	Actual (ramping) value of selected SP. *Read only*
Ramp Rate	rP	SPr enabled in Setup mode	SP ramping rate, in units per hour *Adjustable except in Strategy 6*
Active Alarm Status	ALSt	When one or more alarms are active. **ALM** indicator will also flash	L2 1 — Alarm 2 active; Alarm 1 active; Loop Alarm active

Manual Control
If PoEn is set to EnAb in Setup mode, manual control can be selected/de-selected by pressing the key in Operator mode, via communications, or by changing the status of a digital input if d iG, or d iG2 have been configured for d iAS in Configuration mode.

9. SERIAL COMMUNICATIONS

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

10. 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 SETPOINT INPUT

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 the active SP.*
Isolation:	Slot A - Basic isolation, Slot B - Reinforced safety isolation from other inputs and outputs.

DIGITAL INPUTS

Volt-free(or TTL):	Open(2 to 24VDC) = SP1, Local SP or Auto Mode, Closed(<0.8VDC) = SP2, Remote SP or Manual Mode.
Isolation:	Reinforced safety isolation from inputs and other outputs.

OUTPUTS

Relay

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

Dual Relay

Contact Type & Rating:	Single pole double throw (SPDT); 2A resistive at 120/240VAC. 2A resistive at 120VAC when driving valve directly.
Lifetime:	>200,000 operations at rated voltage/current.
Isolation:	Reinforced safety 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:	20 to 280Vrms (47 to 63Hz). 140Vrms valve direct drive
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.
Protocol:	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.
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, ULC.
EMI:	Complies with EN61326 (Susceptibility & Emissions).
Safety Considerations:	Complies with EN61010-1 & UL3121. 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, 1/4 Din = 96 x 96mm.
Depth Behind Panel:	1/16 Din = 110mm, , 1/8 & 1/4 Din = 100mm.
Weight:	0.21kg maximum.