1/16 - 1/8 - 1/4 DIN VMD CONTROLLERS CONCISE PRODUCT MANUAL (59377-6)

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

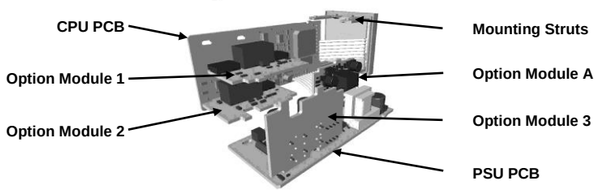
1. INSTALLATION

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.

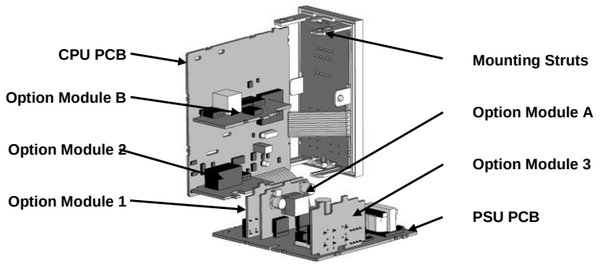
Note: The functions described in sections 2 thru 9 are common to all models.

Installing Option Modules

1/16 Din Size Instruments



1/8 & 1/4 Din Size Instruments



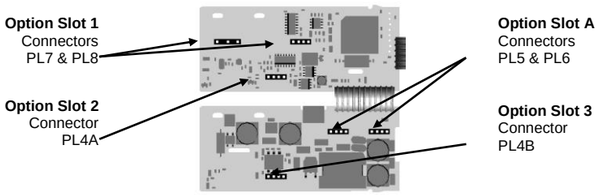
To access modules 1, A or B, first detach the PSU and CPU boards from the front by lifting first the upper, and then lower mounting struts. Gently separate the boards.

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.

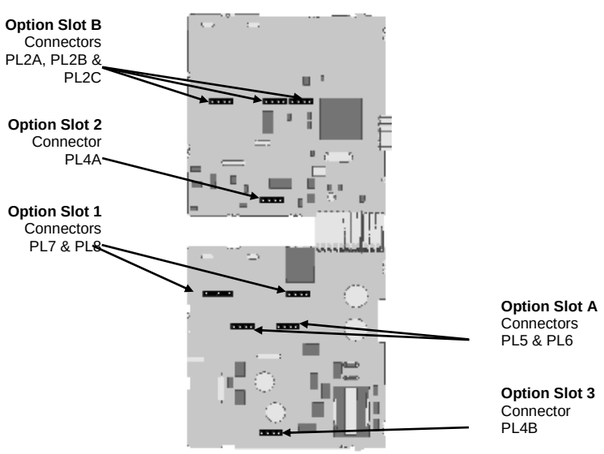
Note: Option modules are automatically detected at power up.

Option Module Connectors

1/16 Din Size Instruments



1/8 & 1/4 Din Size Instruments

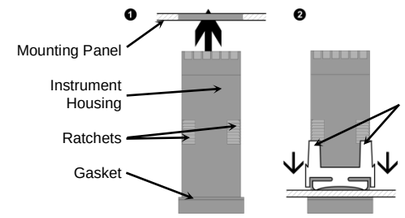


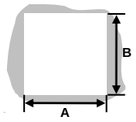
Panel-Mounting

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

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 <u>firmly</u> in position.

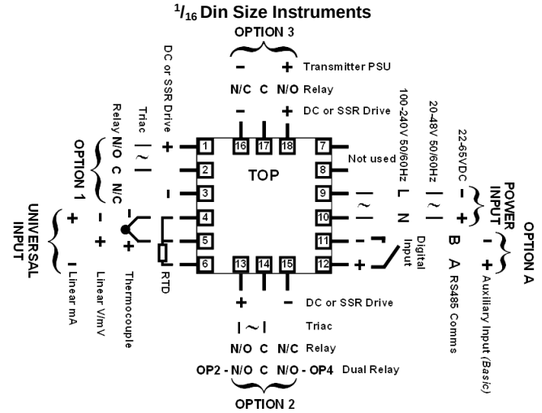
CAUTION: For an effective IP66 & NEMA 4X seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

Rear Terminal Wiring

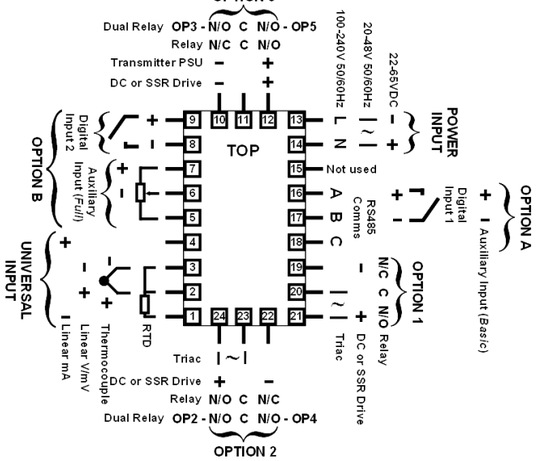
USE COPPER CONDUCTORS (EXCEPT FOR T/C INPUT). CABLE RATING 80°C MIN

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 depend on the exact model and options fitted.

***Note: This controller uses Three-Point Stepping Control. This requires two identical outputs (2 Relays, 2 Triacs, 2 SSR Drivers or 1 Dual Relay) for the valve Open & Close functions. See Output Usage 1-5 in Configuration Mode.**

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

Supplementary Installation Information
- 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 EN6010 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.
- A disconnecting device should disconnect both LINE & NEUTRAL conductors simultaneously.
- The disconnecting device must be easily accessible.

Note: At first power-up the message GotoConF is displayed, as described in section 7 of this manual. Access to other menus is denied until Configuration Mode is completed.

2. 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, 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
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 - ConF

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	L.C	L: 0.0 - 537.7 ºC	P24F	PtRh20% vs 40%: 32 - 3362 ºF
bF	B: 211 - 3315 ºF	L.F	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		0.05 to 5.00 (5 secs to 5 mins 0 secs) Time Valve takes to move between its physical end stops (*full Open to full Closed*).	1.00
Alarm 1Type	ALA1	P_Hi	Process High Alarm	P_Hi
		P_Lo	Process Low Alarm	
		dE	Deviation Alarm	
		bAnd	Band Alarm	
		nonE	No alarm	

Parameter	Lower Display	Upper Display	Description	Adjustment range & Description
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**	ALA2		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
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
		ALA1	Alarm 1 inhibited	
		ALA2	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	roIH		-1999 to 9999 (display value at which output will be maximum)	Range max
Retransmit Output 1 Scale minimum	roIL		-1999 to 9999 (display value at which output will be minimum)	Range min
Output 2 Usage*	USE2		As for output 1	Sec or AI2
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		As for output 1 except Retransmit of PV or SP is not possible.	OPN
Output 5 Usage*	USE5			A1_d
Display Strategy	dISP		1, 2, 3, 4, 5, 6 or 7 *(refer to section 8)*	1
Serial Communications Protocol	Prot	Mbn	Modbus with no parity	Mbn
		MbE	Modbus with Even Parity	
		Mbo	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	1

Comms Write	CoEn	r_Wd	Read/Write	r_Wd
		r_O	Read only	
Auxiliary Input A Usage	A inA	rSP	Remote Setpoint (*basic*)	P in
		P in	Valve Position Indication (*basic*)	
Auxiliary Input B Usage	A inB	rSP	Remote Setpoint (*Full*)	P in
		P in	Valve Position Indication (*Full*)	
Digital Input 1 Usage	d iG1	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 Auxiliary 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 Aux. (Slot B) only*
		Pot	Potentiometer (2KΩ minimum)	
RSP Upper Limit	rSPu	-1999 to 9999. Remote SP for max. input		Range max
RSP Lower Limit	rSPL	-1999 to 9999. Remote SP for min. input		Range min
RSP Offset	rSPo	Constrained within Scale Range Upper & Scale Range Lower limits		0
Configuration Lock Code	CLoc	0 to 9999. Unlock Code for this mode		20

Note: d iG2 has priority over d iG1 if both are configured for the same usage.
If d iG1 or d iG2 =d iS1 the remote setpoint (RSP) input is disabled.

4. SETUP MODE - SEtP

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	0.0 (*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	0.01 to 99.59 (1 sec to 99 mins 59 secs)	5.00
Rate (Derivative Time)	rAtE	0.00 to 99.59 (OFF to 99 mins 59 secs)	0.00
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. The minimum drive effort to begin moving valve.	0.0
Set Valve Open Position	PcuL	*See instructions below to set the valve's fully open and closed positions.*	Max. Aux.
Set Valve Closed Position	PcLL		Min. Aux.
Valve Open Limit	P iuL	P iLL +1 to 100. The maximum position valve will be driven to	100
Valve Closed Limit	P iLL	0 to P iuL -1. The minimum position valve will be driven to	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 SP 1 & SP2 or LSP	Scale Range Minimum
Local Setpoint Value	_LSP		
Setpoint 1 Value	_SP 1		
Setpoint 2 Value	_SP2	- or = before the legend indicates the currently active SP)	
Setup Lock Code	SLoc	0 to 9999	10

Setting the Valve Opened & Valve Closed Positions

With PcuL in the lower display press . The top display shows oPnG.
Press to drive open the valve until it reaches the "fully open" end stop.
Press . The top display will go *Blank* and the Auxiliary Input value will be measured and stored as the value equal to the fully open valve position.
Press . The lower display shows PcLL. Press . The top display shows cLSG.
Press to drive closed the valve until it reaches the "fully closed" end stop.
Press . The top display will go *Blank* and the Auxiliary Input value will be measured and stored as the value equal to the fully closed valve position.

5. AUTOMATIC TUNING MODE - Atun

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. *Pre-tune will not engage if setpoint is ramping, or the PV is less than 5% of input span from the setpoint . Indication remains OFF	OFF
Self-Tune	Stun		
Tune Lock	tLoc	0 to 9999	0

6. PRODUCT INFORMATION MODE - inFo

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 i	Universal input
Option 1 module type fitted	OPn1	nonE	No option fitted
		rLY	Relay output
		SSr	SSR drive output
		tr i	Triac output
		L in	Linear DC voltage / current output
Option 2 module type fitted	OPn2	nonE	No option fitted
		drLY	Dual Relay output
		rLY	Relay output
		SSr	SSR drive output
		tr i	Triac output
		L in	Linear DC voltage / current output
		dc24	Transmitter power supply
Option 3 module type fitted	OPn3	As Option 2	
Auxiliary Option A module type fitted	OPnA	nonE	No option fitted
		r485	RS485 communications
		d iG i	Digital Input*
		rSP i	Auxiliary Input *(basic)**
Auxiliary Option B module type fitted	OPnb	nonE	No option fitted
		rSP i	Auxiliary Input *(full)* and Digital Input 2*
Firmware type	FW	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	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	

7. MESSAGES & ERROR INDICATIONS

These messages indicate that an error has occurred, or there is a problem with the process variable input connection or signal.
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

Parameter	Upper Display	Lower Display	Description	
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.	
Aux. Over Range	Normal	CHHJ **	Auxiliary input over-range	** *also seen wherever Aux value would be displayed*
Aux. Under Range	Normal	CLLJ **	Auxiliary input under-range	
Auxiliary Input Break	Normal	OPEN **	Break detected in Auxiliary 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 fault or Aux fitted in both A & B	
Option B Error		OPnb	Option B module fault	

8. 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.
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 *(initial screen)*	PV and target value of selected SP *Local Setpoints are adjustable in Strategy 2*
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 *(initial screen)*	PV and Valve Position or Flow *Read only*
SP Value	SP	1 & 3 - 7 if digital input is not d iS1 and RSP not configured	Target value of SP *Adjustable except in Strategy 6*
SP1 Value	_SP 1	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 i, 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 i = 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 Valve 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 serial communications, or by changing the status of a digital input if d iG i or d iG2 has been configured for d iAS in Configuration mode.
While in Manual Control mode, the indicator will flash and the lower display will show MMAn. If Valve Position Indication is configured, the lower display will show Pxxx instead of MMAn, where *xxx* is the valve position as read by the Auxiliary Input. P0 means the valve is fully closed, P 100 means the valve is fully opened.

Press to move the valve motor in the "open" direction or to move the valve motor in the "close" direction. Keep pressing the key until the desired valve position is achieved

9. SERIAL COMMUNICATIONS

Refer to the full user guide (available from your supplier) for details.
You cannot connect both configuration port & RS485 port at the same time.

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. "Close *Valve" outputs turn ON.*
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.

AUXILIARY INPUT

Calibration:	±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. *Valve 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. 120VAC max. (240V for alarm or indirect switching of valves).
Lifetime:	>500,000 operations at rated voltage/current.
Isolation:	Basic Isolation from universal input and SSR outputs.

Dual Relay

Contact Type & Rating:	2 x single pole single throw, with shared common; 2A resistive. 120VAC max. (240V for alarm or indirect switching of valves).
Lifetime:	>200,000 operations at rated voltage/current.
Isolation:	Reinforced safety isolation from inputs and other 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 140Vrms (280V max. for alarm or indirect switching of valves) @ 47 to 63Hz.
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.

DC Linear

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:	19 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 RTU.
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:	Complies with EN61326-1:2013
Safety Considerations:	Complies with UL61010-1 Edition 3, EN61010-1 Version 2010 & CSA 22.2 No 1010.192. Pollution Degree 2, Installation Category II.
Front Panel Sealing:	To IP66 & NEMA 4X when correctly mounted – see section 1

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.