






Quick Reference Guide

Controller	Control Loop	Inputs	Outputs	Power Supply
Single-Loop Auto-Tuning				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	2 outputs Function: Control - Heat/Cool, Alarm Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES SD31 Page 27 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	3 outputs, 2 outputs on 1/2 DIN Function: Control - Heat/Cool, Alarm Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES SD_C Page 29 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	2 outputs Function: Control - Heat/Cool, Alarm Hardware: Switched dc, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES SD6C_D Page 33 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 1 auxiliary - Functions: Event, Remote Set point input Hardware: V=(dc, Resistance contact)	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES 96 Page 35 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 2 auxiliary - Functions: Event, Remote Set point, Slidewire, Potentiometer, Current transformer, Cascade, Differential, Ratio Hardware: Thermocouple, RTD, V=(dc), mA, Resistance contact	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit, Duplex, Signal conditioner power supply Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES 988/989 Page 39 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				

Abbreviation Legend

SW=(dc) = Switched Direct Current
DC Pw. Sup. = DC Power Supply
EMR = Electromechanical Relay
H = Horizontal

H/V = Horizontal or Vertical
Hum./Dehum. = Humidify/Dehumidify
Int./Ext. = Internal/External
LCD = Liquid Crystal Display
LED = Light Emitting Diode

mA = Milliamp
N/A = Not Applicable
OC = Open Collector
Opt. Rmt. = Optional Remote
Retx = Retransmit
Rev/Dir = Reverse/Direct

Quick Reference Guide

Size Mounting	Agency Approvals	Control Mode	Indication Display	Accuracy	Communications	Time/Temp Profiling
Single-Loop Auto-Tuning Cont.						
½ DIN 30.8 mm (1.21 in.) (H) 53.6 mm (2.11 in.) (W)	UL®, CSA, CE, NSF, NEMA 4X (IP65)	PID	Single line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU Modbus™, WATVIEW	
SERIES SD31 Page 27 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
½, ⅙ ⅛, ¼ DINs	UL®, CSA, CE, FM, NSF, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU IrDA wireless Modbus™ IrDA via IRCOMM WATVIEW	
SERIES SD_C Page 29 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
⅙ DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	UL®, CSA, CE, FM, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	DeviceNet™ on Canbus	
SERIES SD6C_D Page 33 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
⅙ DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU WATVIEW	
SERIES 96 Page 35 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
⅙ DIN Vertical or Horizontal 55 mm x 102 mm (2.17 in. x 4.02 in.) 102 mm x 55 mm (4.02 in. x 2.17 in.)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU EIA/TIA-422 - Modbus™ RTU	
SERIES 988/989 Page 39 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						

RH = Relative Humidity
 RTD = Resistance Temperature Detector
 SSR = Solid State Relay
 T/C = Thermocouple
 V = Vertical

V=(dc) = Volts Direct Current

Disclaimers







- ① Select models only.
- ② Requires optional enhanced software.

Modbus™ is a trademark of Schneider Automation Incorporated
 DeviceNet™ is a trademark of the Open DeviceNet Vendors Association

Symbols

- ⎓ = Direct Current
- ~ = Alternating Current
- ⎓ = Direct or Alternating Current

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Controller	Control Loop	Inputs	Outputs	Power Supply
Single-Loop				
Auto-Tuning				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 4 auxiliary - Functions: Event Hardware: V=(dc), Resistance contact	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit, Single or Dual Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24V=(ac/dc)
SERIES F4P Page 45 Watlow Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 2 auxiliary - Functions: Event, Current transformer	4 outputs Function: Control - Heat/Cool, Alarm, On-board datalogging memory Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	24V=(ac/dc)
SERIES PDS Page 49 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD	2 outputs Function: Control, Alarm Hardware: Switched dc, EMR	24V=(ac/dc)
MICRODIN® Page 53 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
On-Off				
	1	Single input Hardware: Thermocouple, RTD	Single output Function: Control - Heat/Cool Hardware: Switched dc, EMR	120V~(ac) 230-240V~(ac) 24V~(ac)
SERIES CV Page 57 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	Single input Hardware: Thermocouple, RTD	Single output Function: Control - Heat/Cool, Alarm Hardware: Switched dc, EMR	120V~(ac) 230-240V~(ac) 24V~(ac)
SERIES CF Page 59 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	Single input Hardware: Thermocouple	Single output Function: Control - Heat/Cool, Alarm Hardware: EMR	120V~(ac) 240V~(ac)
SERIES 80M6 Page 61 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				

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Customer Assistance

Size Mounting	Agency Approvals	Control Mode	Indication Display	Accuracy	Communications	Time/Temp Profiling
Single-Loop						
Auto-Tuning Cont.						
¼ DIN 100 mm x 100 mm (3.94 in. x 3.94 in.)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Five lines 4 digit LED 4 line LCD	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU	
SERIES F4P Page 45 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
¾ DIN Sub-panel or Din-rail mounting	UL®, C-UL®, CSA, CE	PID		±0.1 percent span	Ethernet - Modbus™ TCP/IP HTTP, FTP	
SERIES PDS Page 49 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
¾ DIN Sub-panel or Din-rail mounting	UL®, C-UL®, CE	PID		±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU	
MICRODIN Page 53 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
On-Off Cont.						
¾ DIN square 72 mm x 72 mm (2.83 in. x 2.83 in.) or DIN-rail mount	UL®, CSA, CE, ANSI gas appliance	On-off	Single line 4 digit LED	±1 percent span	None	
SERIES CV Page 57 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
¾ DIN square 72 mm x 72 mm or (2.83 in. x 2.83 in.) DIN-rail mount or open board or potted case	UL®, CSA, CE, ANSI gas appliance	On-off	None	±1 percent span	None	
SERIES CF Page 59 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						
Open board	UL®, C-UL®	On-off	None	± 10°F	None	
SERIES 80M6 Page 61 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota						

Quick Reference Guide

Controller	Control Loop	Inputs	Outputs	Power Supply
Single-Loop				
PID with Time/Temperature Profiling				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	3 outputs (2 on SD3R) Function: Control - Heat/Cool, Alarm Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES SD_R Page 63 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	2 outputs Function: Control - Heat/Cool, Alarm Hardware: Switched dc, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES SD6R_D Page 67 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 1 auxiliary - Functions: Event, Remote Set point input Hardware: V=(dc), Resistance contact	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit, Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES 96_AA Page 69 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 2 auxiliary - Functions: Event, Slidewire Hardware: Thermocouple, TRD, V=(dc), mA, Resistance contact	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit, Signal conditioner power supply Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES 981/982 Page 73 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA, RH percent 5 auxiliary - Functions: Cascade, Event Hardware: Thermocouple, TRD, V=(dc), mA, Resistance contact	4 outputs Function: Control - Heat/Cool, Compressor, Alarm, Retransmit Hardware: Single or Dual, Switched dc, Open Collector, SSR, EMR, V=(dc), mA 8 Digital Outputs	100-240V~(ac) 24=(ac/dc)
SERIES F4S Page 77 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				

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Customer Assistance

Size Mounting	Agency Approvals	Control Mode	Indication Display	Accuracy	Communications	Time/Temp Profiling
Single-Loop						
PID with Time/Temperature Profiling Cont.						
1/2, 1/6 1/8 DINs	UL®, CSA, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU IrDA wireless (Except SD3R) Modbus™ IrDA via IRCOMM	4 profiles 40 total steps
SERIES SD_R Page 63						
<i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
1/6 DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	UL®, CSA, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	DeviceNet™ on Canbus	4 profiles 40 total steps
SERIES SD6R_D Page 67						
<i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
1/6 DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU	2 profiles 16 total steps
SERIES 96_AA Page 69						
<i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
1/2 DIN Vertical or Horizontal 55 mm x 102 mm (2.17 in. x 4.02 in.) 102 mm x 55 mm (4.02 in. x 2.17 in.)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU EIA/TIA-422 - Modbus™ RTU	4 profiles 24 total steps
SERIES 981/982 Page 73						
<i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
1/4 DIN 100 mm x 100 mm (3.94 in. x 3.94 in.)	UL®, C-UL®, CE, NEMA 4X (IP65)	PID	Five lines 4 digit LED 4 line LCD0	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU	40 profiles 256 total steps
SERIES F4S Page 77						
<i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						






Quick Reference Guide

Controller	Control Loop	Inputs	Outputs	Power Supply
Single-Loop				
Limits/Alarms				
	1	Single Input Hardware: Thermocouple, RTD	Single output Function: Limit, Alarm Hardware: EMR	120V~(ac) 230-240V~(ac) 24V~(ac)
SERIES LV Page 81 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	Single Input Hardware: Thermocouple, RTD	Single Output Function: Limit, Alarm Hardware: EMR	120V~(ac) 230-240V~(ac) 24V~(ac)
SERIES LF Page 83 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	3 outputs (2 on SD3L) Function: Limit, Alarm Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES SD_L Page 85 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA	2 outputs Function: Limit, Alarm Hardware: Switched dc, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES SD6L_D Page 89 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	1 universal - Hardware: Thermocouple, RTD, V=(dc), mA 1 auxiliary - Functions: Event, Remote Set point Input Hardware: V=(dc), Resistance contact	4 outputs Function: Limit, Alarm, Retransmit Hardware: Switched dc, Open Collector, SSR, EMR, V=(dc), mA	100-240V~(ac) 24=(ac/dc)
SERIES 97 Page 91 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				

Quick Reference Guide

Size Mounting	Agency Approvals	Control Mode	Indication Display	Accuracy	Communications	Time/Temp Profiling
Single-Loop						
Limits/Alarms Cont.						
½ DIN square 72 mm x 72 mm (2.83 in. x 2.83 in.) or DIN-rail mount	FM, UL®, CSA, CE, ANSI gas appliance, DIN 3440	High/low limit	Single line 4 digit LED	±1 percent span	None	
SERIES LV Page 81 <i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
½ DIN square 72 mm x 72 mm (2.83 in. x 2.83 in.) DIN-rail mount or open board or potted case	FM, UL®, CSA, CE, ANSI gas appliance, DIN 3440	High/low limit	None	±1 percent span	None	
SERIES LF Page 83 <i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
½, ⅙, ⅛, ¼ DINs	UL®, CSA, CE, FM, NEMA 4X (IP65)	On-off	Dual line 4 digit Digital LED	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU IRDA wireless (except SD3L) Modbus™ IrDA via IRCOMM	
SERIES SD_L Page 85 <i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
⅙ DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	UL®, CSA, CE, FM, NEMA 4X (IP65)	On-off	Dual line 4 digit Digital LED	±0.1 percent span	DeviceNet™ on Canbus	
SERIES SD6L_D Page 89 <i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						
⅙ DIN 52 mm (2.04 in.) (H) 52 mm (2.04 in.) (W)	FM, CE, NEMA 4X (IP65)	On-off	Dual line 4 digit LED 4 line LCD0	±0.1 percent span	EIA/TIA-485 - Modbus™ RTU EIA/TIA-232 - Modbus™ RTU	
SERIES 97 Page 91 <i>Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota</i>						

Quick Reference Guide

Controller	Control Loop	Inputs	Outputs	Power Supply
Single-Loop				
Temperature Meter				
	1	Single Input Hardware: Thermocouple, RTD	None - Indicator only	120V~(ac) 230-240V~(ac) 24V~(ac)
SERIES TM Page 95 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
Communication Gateways				
		Ethernet to EIA-485/232 Modbus™ RTU converter Allows the following Modbus™ controllers to connect to Ethernet: SERIES SD, 96, 97, 981/982, 998/999, F4, CLS200, POWER SERIES, MICRODIN		24V≈(ac/dc)
EM GATEWAY Page 193 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	1	DeviceNet™ to EIA-485/232 Modbus™ RTU converter Allows the following Modbus™ controllers to connect to DeviceNet™: SERIES 96, 97, CLS200, MICRODIN		11-28V≈(dc)
CDN GATEWAY Page 195 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
Multi-Loop				
Auto-Tuning PID				
	2	1 universal - Hardware: Thermocouple, RTD, V≈(dc), mA 2 auxiliary - Functions: RH percent, Event Hardware: Thermocouple, RTD, V≈(dc), mA, Resistance contact	4 outputs Function: Control - Heat/Cool, Alarm, Retransmit, Signal conditioner power supply Hardware: Switched dc, Open Collector, SSR, EMR, V≈(dc), mA	100-240V~(ac) 24V≈(ac/dc)
SERIES 998/999 Page 99 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				
	2	2 universal Hardware: Thermocouple, RTD, V≈(dc), mA 2 auxiliary - Functions: Event, Current transformer	5 outputs Function: Control - Heat/Cool, Alarm, Retransmit, On-board data logging memory Hardware: Switched dc, Open Collector, SSR, EMR, V≈(dc), mA	24V≈(ac/dc)
SERIES PDD Page 103 Watlow USA Manufacturing Facility (F.O.B.): Winona, Minnesota				