1.6 Specifications

Specifications are the same for the VPR100, VRX100, and VRX150 unless noted otherwise.

Table 1-1 Specifications

	Physical
Enclosure	VPR100 & VRX100 Drawn aluminum case with high impact resistant polycarbonate plastic bezel and abrasion/scratch resistant lens. With the proper panel mounting with the required gasketing and with the front bezel firmly close, the VPR100 meets the criteria for NEMA Type 3 Enclosure for protection from rain and sleet as described in NEMA Standard 250-1991 Sec. 6.4.2.2. VRX150 Drawn aluminum case with high impact resistant polycarbonate plastic bezel.
Mounting (Panel)	1.52 mm to 19.05 mm (0.06" to 0.75") thickness
Dimensions	VPR100 & VRX100 *Bezel:* 144 mm (H) x 144 mm (W) x 43 mm (D) 5.67" (H) x 5.67" (W) x 1.69" (D) *Case:* 137 mm (H) x 137 mm (W) x 295 mm (D) 5.39" (H) x 5.39" (W) x 11.61" (D) VRX150 *Bezel:* 295mm (W) x 279mm (H) x 44.45mm (D) 11.61" (W) x 10.98" (H) x 1.75" (D) *Case:* 137 mm (H) x 137 (W) x 295 mm (D) 5.39" (H) x 5.39" (W) x 11.61" (D)
Weight	VPR100 & VRX100 3.6 kg (8 lbs). VRX150 5.4 kg (12 lbs).
I/O Ports Standard	QWERTY Keyboard Connector (5 pin DIN type) – on front panel behind bezel. May be used to connect to QWERTY keyboard or to ASCII Barcode Reader.
	Environmental
Temperature	*Operating:* 0 to 50°C (32 to122°F). *Storage*: -20 to 70°C (-4 to 158°F). *Relative Humidity*: 10 to 90%, non-condensing at 40°C.
Altitude	< 2000 meters
Installation Category	II
Pollution Degree	2
Power	Universal supply, 85 to 265 VAC, 50/60 Hz, 45 VA.
Fuse Rating	2.0 amp/250VAC slow blow type. Not replaceable by operator

continued

Table 1-1 Specifications (continued)

Attributes	
Display	VPR100 & VRX100 *Type*: Color LCD active matrix. *Screen Size*: 139.7 mm (5.5" diagonal) *Resolution*: 320 x 240 pixels. *Update Rate*: 1 second. *Trend Timebase*: 5 min. to 4 hrs/screen; 2 cm/hr to 72 cm/hr vertical, 3 cm/hr to 114 cm/hr horizontal. VRX150 *Type*: Color LCD active matrix. *Screen Size*: 264.2 mm (10.4") diagonal *Resolution*: 640 x 480 pixels. *Update Rate*: 1 second. *Trend Timebase:* 5 min. to 4 hrs/screen; 0.5 cm/hr to 154 cm/hr vertical, 0.8 cm/hr to 246 cm/hr horizontal.
Keys	12 membrane keys.
Data Storage	*Media*: 3.5" floppy disk. *Data Types*: Analog points, calculations, discrete status, alarms, diagnostics. *Trends*: VRX100/VPR100: 3 max (6 points max. each) VRX150: 3 trends max (12 points max. each) *Unit Data:* 1 (up to 12 points, 10,000 records). *Trend & Unit Data combined point capacity:* 18 *Alarm History*: Up to 500 records *Event History:* Up to 500 records *Diagnostic History:* Up to 500 records *VPR100 & VRX150 Setpoint Programs:* 224 maximum on 3.5" floppy disk. Programs must be stored on a separate disk from Data Trend Storage information. *Storage Rate Range*: 0.25 to 3600 sec. *Capacity*: Automatically calculates storage time based on storage rate.
Control Loops	*Number*: VPR and VRX150: Up to 4. VRX100: Up to 2 *Type*: PID, On/Off, Cascade, Split Output, Ratio, DIAT
Auto Tune	Each loop can be pre-tuned automatically to establish acceptable tuning parameters. On-line fuzzy overshoot suppression.
Setpoint Program Capability	
Number of Programs (VPR and VRX150 only)	Memory can store 96 programs for a single channel programmer, 48 programs for a dual channel programmer, 32 programs for a three channel programmer, and 24 for a four channel programmer. Programs can also be stored to floppy disk. Programmer has ability to start a program at a predetermined time.
Number of Segments	63 segments per profile
Ramping Capability	Ramp X - Ramp rate is set by specifying x degrees per second, per minute, or per hour.
	Ramp T - Ramp rate is set by selecting the time to go from previous setpoint to next setpoint in t time.
	Ramp E - Ramp rate is set to increment by ΔSP for every pulse of a digital input.
	Value Duration Ramp - Ramp rate is based on the start value of the ramp and the time specified to reach the next soak start value.
Ramp Time Range	0-9,999,999 hours, minutes, or seconds.

Table 1-1 Specifications (continued)

Setpoint Program Capability (continued)	
Soak	Guaranteed or non-guaranteed. Can be applied to ramp or soak segment or across entire profile/program.
Soak time range	0-9,999,999 hours, minutes, or seconds.
Program Cycling	Entire programs or portions of a program can be cycled up to 99 times. Loops can be nested up to 4 deep.
Startup/Shutdown	Can be set up to use a predefined startup profile separate from the normal processing programs. Shutdown profile can be attached to the end of a profile and can be jumped to for emergency shutdown.
PV Hot Start	Can start the profile at the point where the present PV value first intersects the profile.
Batch Programming	1 to 255 Batch numbers. Batch number is assigned by the programmer and is incremented automatically when batch is started. Using a keyboard or bar code reader and the front keyboard connector, a batch can be labeled with a name of up to 8 characters.
Profile Events	Up to 16 events can be defined in each segment of a profile. Each event's state is activated at the beginning of the segment and is held throughout the segment.
Analog Inputs	
Number	Up to 6 universal, up to 12 TC/EMF and Pyrometer only.
Input Types	Universal types are EMF (mV, V, mA via shunt), Thermocouple, RTD and Pyrometer.
All Types	*Resolution:* 15 bits (14 bits plus sign). *Scan Rate:* 250 msec for 2 inputs, and 2 control loops and 2 Profilers and 12 Calc. Values 500 msec for 8 inputs and 4 control loops and 4 Profilers and 32 Calc. Values 1 sec for 12 inputs and 4 control loops and 4 Profilers and 32 Calc. Values *Isolation:* Fully isolated, 400 VDC peak. *Normal Mode Rejection:* 60 dB (1,000:1). *Common Mode Rejection:* 120 dB (1,000,000:1) (@ 100 ohm source). *Normal Mode Voltage Limit:* RMS equal to high span limit (@ mains/line frequency). *Common Mode Voltage Limit:* 400 VDC peak. *Input Impedance:* >20 megohms. *Accuracy:* See Tables 1-2 and 1-3. *Temperature Effects:* See Table 1-3. *Ranges:* Assigned per point based on range table. See Tables 1-2 and 1-3.
TC/EMF	*Source Resistance Error:* 0.3 microvolts per 100 ohms. *Reference Junction Error (TC only):* 0.3°C (0.5°F). *Open Input Check:* Bleeder type (upscale, downscale, off).
RTD	*Excitation Current:* 0.15 mA. *Switching:* Common "B" lead. *Maximum Lead Resistance:* 5 ohms.

Table 1-1 Specifications (continued)

Analog Outputs	
Number	Up to 3 current outputs. Additional time prop. Outputs (DAT) available. Total maximum of 8 analog outputs.
Type	Current output (CAT), Voltage output (VAT) (customer selectable with internal switch), Time Proportion output (DAT), Position Proportional (PP), Direction Impulse Adjusting Type (DIAT).
CAT (Current Adjusting Type)	*Current:* Selectable from 0 to 20 mA. *Maximum Load:* 800 ohms maximum per CAT output. *Isolation:* 400 VDC peak (input/output) 30 VDC peak. (input to ground) *Resolution:* 12 bits, 0.025%.
VAT (Voltage Adjusting Type)	*Voltage*: Selectable between 0 and 5 Volts. *Minimum Load:* 1000 ohms. *Isolation*: 400 VDC peak (input/output) 30 VDC peak. (input to ground) *Resolution*: 12 bits, 0.025%.
DAT (Duration Adjusting Type)	Uses any discrete output relay or open collector output. *Impulse Time:* ≥ 1 *Resolution:* 4.0 msec. *Minimum Off Time:* Off, ≥ 0 *Minimum On Time:* Off, ≥ 0
Pos Prop (Position Proportional Type)	Up to 4 available. 4 Position Proportional outputs requires use of open collector outputs; each output requires use of dedicated analog input Slidewire resistance: 100 to 1000 ohms Drive unit speeds: 10 to 220 seconds
DIAT (Direction Impulse Adjusting Type)	3 maximum using instrument's discrete output hardware. 4 DIAT outputs requires use of external relays. Drive unit speeds 10 to 220 seconds.
Transmitter Power Supply (Standard Output)	
	24 VDC, 90 mA max.
Discrete Inputs/Outputs	
Combinations available	3 DIs/4 DOs (Relay Outputs) 6 DOs (Relay Outputs) 8 DIs/8 DOs (Open Collector Outputs) 16 DIs/16 DOs (Open Collector Outputs) 8 DIs/24 DOs (Open Collector Outputs)
Inputs	*Type*: Dry contact actuation. *Input Level:* 24 VDC, 15 mA (internally supplied). *Isolation:* 30 volts point-to-ground.
Relay Outputs	*Type*: Form C. *Max Switch Current:* 14/5 (NO/NC) Amps, 120 VAC resistive *Max Switch Voltage*: 265 VAC *Max Switch Power:* 200W, DC; 2000 VA, AC *Max Carrying Current:* 2 Amps @ 250 VAC; 5 Amps @ 120 VAC, 2 Amps @ 24 VDC.

Table 1-1 Specifications (continued)

Discrete Inputs/Outputs (continued)	
Solid State AC Outputs	*Type:* Form A contacts. *Max Output Current:* 2 Amps. *Voltage Range:* 12-280 VAC. *Minimum Current:* 20 mA. *Switchbase:* Zero-crossing.
Solid State DC Outputs	*Type:* Form A contacts. *Max Output Current:* 2 Amps. *Voltage Range:* 5-60 VDC. *Minimum Current:* 20 mA.
Open Collector Outputs	Open transistor collector output rated at 30VDC max, 100mA max. User must provide a relay for each output along with external 24VDC power supply for the relays.
Digital Input Capability	3, 8, or 16 Digital Inputs
	Digital Inputs capable of Run, Hold, Reset, Jump, Segment Advance, Guaranteed Soak, Switch to Second input (PV Channel Select), Auto/Manual Select, Batch Start/Stop, Event mark of data, Fast Forward, PV Hot Start, Remote Program Selection. Can be used in logic operators.
Digital Output Capability	4 or 6 Relay Outputs; 8, 16 or 24 Open Collector Outputs
	Digital Outputs can be triggered by Alarms, Program Status, Diagnostics, Math Result, Logic Result, or DAT Control Outputs.
Performance/Capacities	
Math Calculations	Standard Math includes: 8 Calculated Values along with the following Math functions: Free Form Math, Math Operators (+, -, x, ÷, Absolute Value, Square Root, Std. Deviation), Free Form Logic, Logic Operators (AND, OR, XOR, Inverter, Flip Flop, One-Shot). Logic gates can accept up to 8 inputs.
	VPR100 only Math Level 1 includes: 16 Calculated Values with the functions from Standard Math along with the following types of pre-packaged algorithms: Signal Select, Compare, Signal Clamp, Periodic Timer, Interval Timer, Counter, Relative Humidity, Standard Splitter, Scaling.
	Math Level 2 includes: 32 Calculated Values with the functions and algorithms from Standard Math and Math Level 1, along with the following types of pre-packaged algorithms: Peak Picking, Function Generator, Rolling Average, Carbon Potential, Mass Flow, F0 Calculation, Multiple Input Average, Single Point Average, Advanced Splitter, Continuous Emissions Block Average and Rolling Average.
Constants	Up to 16
Alarms	Up to 16
Totalizers	Up to 3 optional (VPR100), up to 12 optional (VRX100 & VRX150).
Control Loops	*Number:* VPR and VRX150: Up to 4. VRX100: Up to 2 *Type:* PID, On/Off, Cascade, Split Output, Ratio, DIAT

Table 1-1 Specifications (continued)

Performance/Capacities (continued)	
Primary Displays	Up to 10 displays may be assigned from the following 22 formats: Vertical Trend, Vertical Trend Digital, Vertical Trend w/6 Divisions, Horizontal Trend, Horizontal Trend Digital, Horizontal Trend Bar, 3pt Vertical Bar Graph, 6pt. Vertical Bar Graph, Panel Display, Unit Data, Panel Meter, Alarm Summary, Storage Status, Totalizer, Loop w/Bar Graph, Digital Loop, Loop w/2 Bar Graphs, Loop w/3 Bar Graphs, Loop w/4 Bar Graphs, Setpoint Profiler w/2 Bar Graphs, Setpoint Profiler w/3 Bar Graphs, Setpoint Profiler Trend. *The VRX150 has these additional formats:* Panel Display w/4 Large Fonts (instead of Panel Display), Setpoint Profiler w/4 Bar Graphs, Vertical Trend Digital, 4 pt. Vertical Bar Graph (instead of 3 pt.), Vertical Trend Bar, 4 pt. Horizontal Bar Graph (instead of 3 pt.), 6 pt. Horizontal Bar Graph, Analog Points Summary, Discrete Points Summary, Process Summary
Support Displays	13 (menu access).
Communications (optional)	*Type:* RS-422/485, Honeywell Binary Modbus™ RTU protocol *Connection:* 2 twisted pairs with shield (5 wires). *Distance:* 600 meters, (2000 feet). *Number of links:* Up to 30 *Baud Rate:* 1200, 2400, 4800, 9600, 19.2K, 38.4K, 76.8K. *Parity:* Selectable; odd, even, none.
Optional Software Accessories	
SDA	Data Analysis Software
SCF	Configuration Software

Table 1-2 Analog Input Accuracy--Linear types

Input Range	**Accuracy at Calibration Temperature**		
	+/- Accuracy		**+/- Temperature Effects**
	% Range	**mV**	
-25 to 25 mV	0.02	0.01	0.003 mV per °C
-75 to 75 mV	0.02	0.03	0.009 mV per °C
-200 to 1000 mV	0.02	0.24	0.037 mV per °C
-200 to 5000 mV	0.03	1.56	0.150 mV per °C

Table 1-3 Analog Input Accuracy--Non-linear types

Type	Accuracy at Calibration Temperature						
	Operating Span [1]		+/- Accuracy			+/- Temperature Effects	
	°F	°C	% Range	°F	°C	mV per °F	mV per °C
Thermocouples - ITS-90 except where noted							
J	*0 to 2190*	*-18 to 1199*	0.1	2.2	1.2	0.005	0.009
K	*0 to 2500*	*-18 to 1371*	0.1	2.5	1.4	0.005	0.009
E	*-450* to -241 -240 to *1830*	*-268* to -152 -151 to *999*	0.6 0.1	13.7 2.3	7.6 1.3	0.005	0.009
T	*-300* to *700*	*-184* to *371*	0.1	1.0	0.6	0.002	0.003
N	*0 to 2372*	*-18 to 1300*	0.1	2.4	1.3	0.005	0.009
B	*110* to 949 950 to *3300*	*43* to 509 510 to *1816*	1.2 0.1	38.3 3.2	21.3 1.8	0.002	0.003
R	*0 to 3210*	*-18 to 1766*	0.1	3.2	1.8	0.002	0.003
S	*0 to 3210*	*-18 to 1766*	0.1	3.2	1.8	0.002	0.003
W5/W26 [2]	*0 to 4200*	*-18 to 2316*	0.1	4.2	2.3	0.005	0.009
PLAT II [2]	*-100 to 2500*	*-73 to 1371*	0.1	2.6	1.4	0.005	0.009
NI-NIMO	*32 to 2502*	*0 to 1372*	0.1	2.5	1.4	0.005	0.009
RTD							
CU10 [3]	*-100* to 155 156 to *310*	*-73* to 68 69 to *154*	0.1 0.2	0.4 0.8	0.2 0.4	0.005	0.009
PT100	*-300 to 1570*	*-184 to 854*	0.1	1.9	1.1	0.005	0.009
Pyrometry (Rayotube & Spectray) Types							
18890-3302	*750 to 1600*	*399 to 871*	0.1 typical	0.8	0.4	0.002	0.003
18890-0073	*800 to 1800*	*427 to 982*	0.1 typical	1.0	0.5	0.002	0.003
18890-0074	*1100 to 2300*	*594 to 1260*	0.1 typical	1.2	0.6	0.002	0.003
18890-0035	*1200 to 2600*	*649 to 1426*	0.1 typical	1.4	0.7	0.002	0.003
18890-0412	*1375 to 3000*	*747 to 1648*	0.1 typical	1.6	0.9	0.002	0.003
18890-0075	*1500 to 3300*	*816 to 1815*	0.1 typical	1.8	1.0	0.002	0.003
18890-1729	*1650 to 3600*	*899 to 1982*	0.1 typical	0.9	1.0	0.002	0.003
18890-00643	*1850 to 4000*	*1010 to 2204*	0.1 typical	2.2	1.2	0.002	0.003
18890-0216	*2110 to 4600*	*1155 to 2537*	0.1 typical	3.5	1.4	0.002	0.003
18890-5423	*2210 to 5000*	*1210 to 2760*	0.1 typical	3.8	1.5	0.002	0.003
18890-0163	*200 to 1000*	*94 to 537*	0.1 typical	0.8	.4	0.002	0.003
18899-8814	*340 to 1800*	*172 to 982*	0.1 typical	1.4	.81	0.002	0.003
18894-9014	*752 to 2552*	*400 to 1400*	0.1 typical	1.7	1.0	0.002	0.003
18894-0579	*752 to 2552*	*400 to 1400*	0.1 typical	1.7	1.0	0.002	0.003
Spectray 18885	*1832 to 3452*	*1000 to 1900*	0.1 typical	1.6	0.9	0.005	0.009
Spectray 18885-1	*1292 to 2912*	*700 to 1600*	0.1 typical	1.6	0.9	0.005	0.009
Spectray 18885-2	*806 to 1400*	*430 to 760*	0.1 typical	0.6	0.3	0.005	0.009
Spectray 18886	*1833 to 3452*	*1001 to 1900*	0.1 typical	1.6	0.9	0.005	0.009
Spectray 18886-1	*1292 to 2912*	*700 to 1600*	0.1 typical	1.6	0.9	0.021	0.037
18874-0578	*752 to 2552*	*400 to 1400*	0.1 typical	1.7	1.0	0.083	0.150
18875-0579	*752 to 2552*	*400 to 1400*	0.1 typical	1.7	1.0	0.083	0.150

1 Italicized values indicate overall input range.

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3 Accuracy for the calibrated channel. The factory calibrates channel #1. If calibrated on channel #1 channel #6 may be as much as 5.0 Degrees F higher. If using all 6 inputs for CU10 it is recommended to field calibrate on channel #3 or channel #4 to minimize the correction needed. Use Analog Input Value Adjust screen to compensate the other channels.

Table 1-4 Standards

This product is designed and manufactured to be in conformity with applicable U.S., Canadian, and International (IEC/CENELEC/CE) standards for intended instrument locations. The following Standards and Specifications are met or exceeded.

Case Protection (VPR100 & VRX100 only)	With the proper panel mounting with the required gasketing and with the front bezel firmly close, the instrument meets the criteria for NEMA Type 3 Enclosure for protection from rain and sleet as described in NEMA Standard 250-1991 Sec. 6.4.2.2.
Rear of Panel	IEC 529, IP 20; EN 60529, IP 20
Flammability Rating	UL 94 - V2
Vibration Level	5 to 15 Hz, 1mm displacement; 15 to 150 Hz, 0.5g acceleration
Electromagnetic Compatibility	CE EMC Directive 89/336/EEC
Safety	VPR100/VRX100: CE Low Voltage Directive 73/23/EEC (EN 61010-1). For US, ANSI/ISA S82-1994. For Canada, CAN/CSA - C22.2 No. 1010.1-92
Intended Instrument Locations	Rack or panel mounting in control room or industrial environments (operator accessibility front of panel only) Installation Category II with grounded mains supply from isolation transformer or GFI (ground fault interrupter) Pollution Degree 2 with rear of panel enclosed, in industrial environment