$^1/_8$ DIN Motorized Valve Controller

V100

■ **Boundless motorized valve controller**
– no need for slidewire feedback; improves reliability

■ **Two sealed 5A control relays**
– suitable for direct connection to the valve, reducing installation costs

■ **Universal process input with integral 2-wire transmitter power supply**
– direct connection for any process signal

■ **Retransmission of process variable**
– analog output for recorder or datalogger

■ **IP65/NEMA3 front face**
– ideal for use in dusty/wet environments

■ **Quick code or PC configuration**
– simple to use Windows™-based PC configuration package

■ **RS485/Modbus serial communication**
– SCADA, PLC or open system integration

V100
– dedicated $^1/_8$ DIN controller
for motorized valves

ABB

V100

The V100 Valve Position controller is a dedicated, single loop controller designed for direct control of motorized valves.

Universal input and integral transmitter power supply ensure that the V100 has the capabilities to measure a wide range of process signals such as temperature, pressure, flow and level.

Two 5A relays are fitted as standard for either direct control of the positioner or via intermediate relays plus retransmission of the process variable for connection to a recorder or datalogger. Further I/O capabilities can be added, such as an alarm relay, remote set point and digital input, to suit the application.

The configuration of the V100 is achieved by moving the security switch and entering a simple code from the front panel keys or via our PC configuration package. No passwords, no input links, no complications.
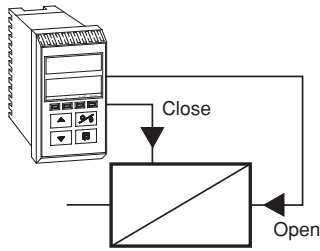
With IP65/NEMA3 front panel protection and superior RF immunity as standard the V100 has been designed to control reliably in the harshest of today's industrial environments.
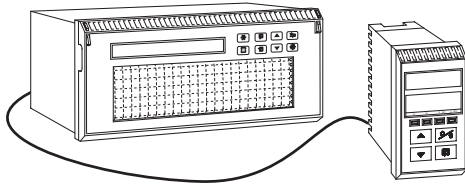
Process Connections

KEY: Standard / Option
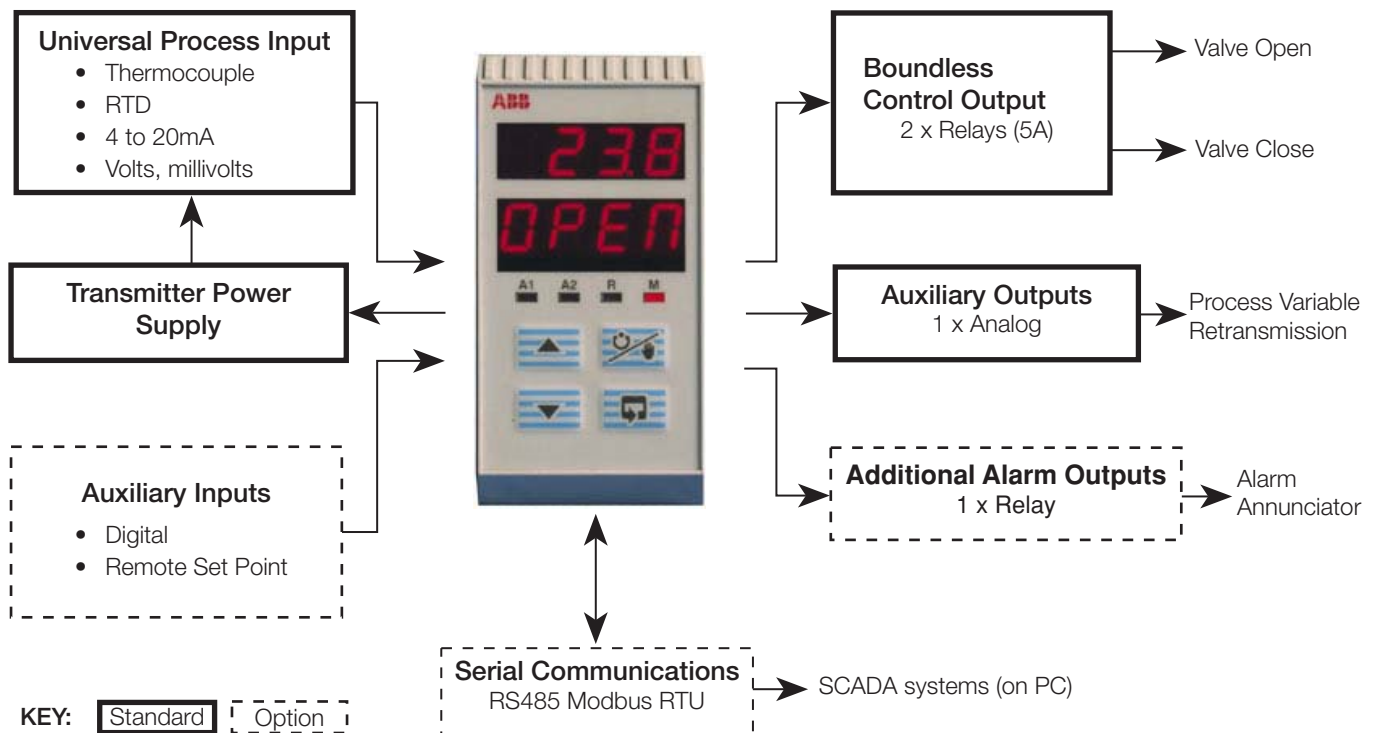
Applications

PID Control

Boundless control of an electrically-positioned valve with a travel time between 10 to 5000s using the in-built 5A relays. The V100 gives pulsed outputs to the valve which are based on the difference in Process Variable and Set Point. The V100 signals the direction and time of travel to the valve. The controller does not require information on the absolute regulator position but uses the PV inputs as its feedback. The di dband setting prevent the valve from hunting.

Retransmission

As standard, the V100 has a 4 to 20mA retransmission of the process variable for connection to a chart recorder, datalogger or PLC.
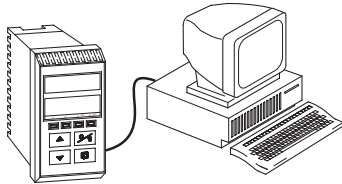
PC Configuration

To make configuration of the V100 quicker and simpler a WINDOWS-based configuration software is available. The V100 is supplied with an in-built PC configurator port as standard.

Configurators can be saved and downloaded to other instruments and a printout generated.
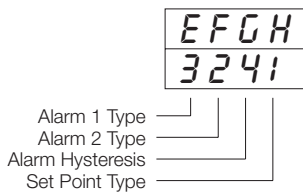
Quick Code Setting

A simple 4-digit code enables all standard parameters to be set from the front face.
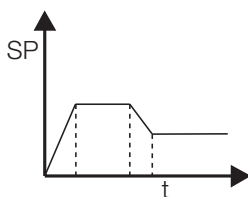
Ramp/Soak Set Point Profiles

The ramp/soak facility available on every V100 provides for a single program, four-segment profile. This facility also includes guaranteed ramp/soak, repeat program, skip and reset.
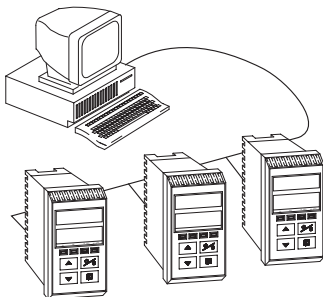
RS485/Modbus

Fitted with an optional RS485 serial communication board, the V100 can communicate with PLCs and SCADA systems using the Modbus protocol.

Specification

Summary

PI, PID single loop, valve position controller

Fully user configurable

Hoseproof front face

PC configuration

Operation

Display

High-intensity 7-segment, 2 x 4-digit LED display

Display range	–999 to +9999
Display resolution	±1 digit
Display height	10mm (0.39 in.)

Configuration

User-defined via front panel or via PC configurator

Control Functions

Control types

P+I or P+I+D Boundless

Valve travel time

10 to 5000s

Adjustable deadband (engineering units)

–999 to +9999

Control terms

P = 0.1 to 999.9%

I = 1 to 7200s

D = 0.1 to 999.9s

Set points strategies

Local

Remote

4 selectable fixed value

Ramping set point

Profile controller

Number	4 ramp/soak segments
Features	Guaranteed ramp/soak, self-seeking set point, program repeat
Controls	Run, Hold and Stop from front panel switches Run/Hold or Run/Stop from digital input

Alarms

Number	Two user-defined
Type	High/Low process High/Low deviation

Standard Build

Relay output

Two relays with arc suppression components included as standard (SPDT) – 5A @ 115/230V AC, 5A @ 24V DC

Logic output

18V DC at 20mA

Min. load 400Ω

PV retransmission

Analog, configurable in the range of 4 to 20mA

Max. load	15V (750Ω at 20mA)
Accuracy	≤0.25% of span

Analog Inputs

Number

One standard process variable

One optional remote set point input

Input sampling rate

250ms per channel

Type

Universally configurable

Channel 1	Thermocouple (THC)
	Resistance Thermometer (RTD)
	Millivolt
	Current
	DC voltage
Channel 2	4 to 20mA

Input impedance

mA	100Ω
mV, V	>10MΩ

Linearizer functions

Programmable for standard inputs:

Square Root, THC types B, E, J, K, N, R, S, T or Pt100

Broken sensor protection

Upscale drive on THC and RTD

Downscale drive on milliamps and voltage

Cold junction compensation

Automatic CJC incorporated as standard

Stability	<0.05°C/°C change in ambient temperature

Input protection

Common mode isolation >120dB at 50/60Hz with 300Ω imbalance

Series mode rejection >60dB 50/60Hz

Transmitter power supply

24V, 30mA max. powers one 2-wire transmitter

Optional I/O specification

Relay output

SPDT 5A @ 115/230V AC

Digital input

Type	Volt-free
Minimum pulse	250ms

Modbus serial communications

Connections RS422/485, 2 or 4-wire

Speed 2.4k or 9.6k baud rate

Protocol Modbus RTU slave

Remote Set Point Input

4 to 20mA DC, 100Ω nominal input impedance

Preset to process variable engineering units

Physical

Size

48mm wide x 96mm high x 125mm deep
(1.89 in. wide x 3.78 in. high x 4.92 in. deep)

Weight

250g (0.5lb) approx.

Electrical

Voltage

85 to 265V AC (50/60Hz)
24V DC

Power consumption

<6VA

Environmental

Operating limits

0 to 55°C (32 to 131°F)
5 to 95%RH non-condensing

Temperature stability

<0.02% of reading or 2µV/°C (1µV/°F)

Front face

IP65 (NEMA3), case rear IP20

EMC

Emissions and Immunity

Meets requirements of IEC 61326 for an Industrial Environment

Design and manufacturing standards

Designed to meet CSA requirements
CE Mark

Electrical safety

EN61010

Standard Analog Input Ranges

Thermocouple	Maximum Range °C	Maximum Range °F	Accuracy (% of reading)
B	−18 to 1800	0 to 3270	0.25% or ±2°C (3.6°F) [above 200°C (392°F)] *
E	−100 to 900	−140 to 1650	0.25% or ±0.5°C (0.9°F)
J	−100 to 900	−140 to 1650	0.25% or ±0.5°C (0.9°F)
K	−100 to 1300	−140 to 2350	0.25% or ±0.5°C (0.9°F)
N	−200 to 1300	−325 to 2350	0.25% or ±0.5°C (0.9°F)
R	−18 to 1700	0 to 3000	0.25% or ±1.0°C (1.8°F) [above 300°C (572°F)] *
S	−18 to 1700	0 to 3000	0.25% or ±0.5°C (0.9°F) [above 200°C (392°F)] *
T	−250 to 300	−400 to 550	0.25% or ±0.5°C (0.9°F)

* For B, R and S thermocouples, performance accuracy is not guaranteed below value stated

Min. span below zero   Type T 70°C (126°F)   THC standards   DIN 43710
                   Type N 105°C (189°F)   IEC 584

RTD	Maximum Range °C	Maximum Range °F	Accuracy (% of reading)**
Pt100	−200 to 600	−325 to 1100	0.25% or ±0.5°C (0.9°F)

** RTD, 3-wire platinum, 100Ω per DIN 43760 standard (IEC 751), with range of 0 to 400Ω

Linear Inputs	Range	Accuracy (% of reading)
Milliamps	0 to 20mA	0.25% or ±2µA
Milliamps	4 to 20mA	0.25% or ±2µA
Volts	0 to 5V	0.25% or ±200µV
Volts	1 to 5V	0.25% or ±200µV
Millivolts	0 to 50mV	0.25% or ±20µV

Square Root Input	Range	Accuracy (% of reading)***
Milliamps	4 to 20mA	0.25% or ±2µA

*** Below input of 4.64mA (20% flow) the input is linear

Overall Dimensions

Dimensions in mm (in.)

119 (4.64)

40 (1.57) 79 (3.11)

14.7 (0.58)

48 (1.89)

91 (3.58)

96 (3.78)

2.7 (0.11)

44.6 (1.76)

Cut-out dims. $45^{+0.6}_{-0}$ wide x $92^{+0.8}_{-0}$ high

($1.77^{+0.02}_{-0}$ wide x $3.62^{+0.03}_{-0}$ high)
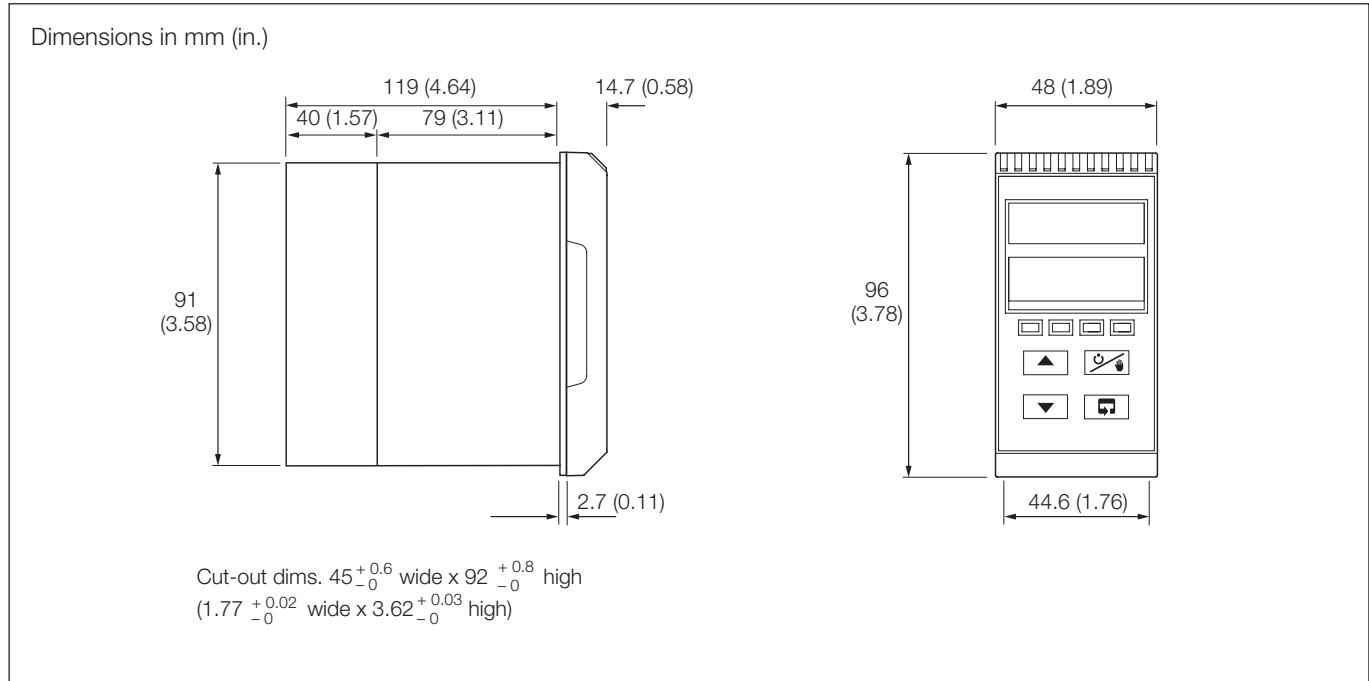
Electrical Connections

Remote Set Point Input (−) — 13
Remote Set Point Input (+) — 14
Digital Input (−) — 15
Digital Input (+) — 16

Close Valve { Relay 2 Normally Open — 17
Relay 2 Common — 18
Relay 2 Normally Closed — 19

Tx { + — 20 / − — 21
RS485 { Tx/Rx { + — 22 / − — 23
Common — 24

Relay 3 Normally Open — 21
Relay 3 Common — 22
Relay 3 Normally Closed — 23

20
24

1 — Analog Input (−)
2 — Analog Input (+)   } See below
3 — Analog Input (Rtd)
4 — Transmitter PSU (+)
5 — Logic / Analog Output (+)
6 — Analog Output (−)   } Retransmission 1
7 — Logic Output (−)
8 — Relay 1 Normally Open
9 — Relay 1 Common   } **Open Valve**
10 — Relay 1 Normally Closed
11 — Neutral   } AC power   − } DC power option
12 — Live   +

Thermocouple, Millivolts and Volts

1 — (−)
2 — (+)
3
4

Milliamps (100 shunt placed across Terminals 1 and 2)

1 — (−)
2 — (+)
3
4

3-Lead RTD

1 — Red
2 — Red
3
4 — White

2-Lead RTD and Resistance

1
2 — Red
3
4 — White

Milliamps using internal 2-wire transmitter power supply
(100Ω shunt placed across Terminals 1 and 2)

1
2 —
3 — Tx
4 —
5 +

Ordering Information

V100 ¹/₈ DIN Motorized Valve Controller	V100	/	X	X	X	X	/	X	X	X	X
Options											
Standard *			0	1							
1 additional alarm relay + 1 digital input + remote set point 4 to 20mA			0	2							
1 digital input + remote set point+ RS485/Modbus			0	3							
Power Supply											
85V to 265V AC					0						
24V DC					1						
Build											
ABB Standard						0					
Programming/Special Features											
Configured to factory standard								S	T	D	
Configured to customer requirements								C	U	S	
Special features								S	P	X	X

* As standard the V100 is fitted with 2 relays (open/close), 4 to 20mA retransmission, universal input and transmitter power supply.

Accessories

PC Configuration Kit (part no. C100/0700)

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Printed in UK (08.07)

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