WEST Control Solutions

Selection Guide

Product Catalog

Temperature and process control instrumentation

Introducing West Control Solutions

Focused on providing valued temperature and process control expertise, global presence and support

West Control Solutions (WCS), a Fortive operating company, is home to PMA, West Instruments and CAL Controls. This leading group combined their resources and expertise as a single organization to deliver innovative, cost-effective, and high-quality products that today's process automation marketplace demands.

From simple, entry-level devices to highly sophisticated, functionally-rich solutions, our comprehensive product portfolio includes single and multi-loop controllers, limit devices, indicators, SSRs and transmitters along with recorders and tools for data acquisition.

WCS pride ourselves on being a dedicated global team of temperature and process control experts, who can provide in-depth application knowledge, and are always there to support our customers. As a result, our products are repeatedly used in control applications such as plastics machinery, ovens, furnaces, laboratory and test equipment, packaging machinery and food processing and many more.

Contents

Single Loop Panel Mounted Controllers 4

Multi-loop Panel Mounted Controllers 16

DIN Rail Mounted Devices 22

Panel Mounted Indicators 28

Limit and Monitor Devices 32

Digital Thermostats 39

Paperless Recorders 43

Pressure Sensors 45

Single Loop Panel Mounted Controllers

Model	MAXVU	3200	3300, 9300 & 9400	9500P	6100+, 8100+ & 4100+	6170+, 8170+ & 4170+	N2300	N6400	Pro 16	Pro 8	Pro 4
Product Family	MAXVU	CAL	CAL	CAL	P-Series	P-Series	N-Series	N-Series	West Pro	West Pro	West Pro
Page Number	5	6	7	8	9	10	11	12	13	14	15
Front Format											
1/32 DIN (24 x 48mm)		●	●				●				
1/16 DIN (48 x 48mm)	●		●	●	●	●		●	●		
1/8 DIN (96 x 48mm)	●				●	●				●	
1/4 DIN (96 x 96mm)					●	●					●
1/8 DIN horizontal (48 x 96mm)											
Depth (behind panel)	70mm		107mm	107mm	1/16 110mm, other 100mm	1/16 110mm, other 100mm	110mm	110mm	112mm	118mm	118mm
Display											
Display type	Large 2 x 4 digit LED		1 x 2 digit LED (1)	2 x 4 digit LED	2 x 4 digit LED	2 x 4 digit LED	1 x 4 digit LED	2 x 4 digit LED	1 x 4 digit LED + 1 x text	2 x 4 digit LED	2 x 4 digit/ text/bar LED
Connectors											
Screw terminal - fixed	●		●	●	●	●	●	●		○	○
Screw terminal - plug-in		●							●		
Spade terminals										○	○
Inputs											
Thermocouple/RTD	●	●	●	●	●	●	●	●	●	●	●
DC Linear V/mA	●			●	●	●	●	●	●	●	●
Digital input					1 or 2	1 or 2			2 or 4	1 or 3	2 or 4
Remote setpoint					○	○			○	○	○
Outputs											
Max. number of outputs	3	2	2	3	3	4	3	3	6	5	6
Relay	○	●	○	●	○	○	●	○	○	○	○
SSR driver	○	●	○	○	○	○	●	○	○	○	○
DC linear				○	○	○		○	○	○	○
Triac					○	○		○			
Transmitter PSU					○	○			○	○	○
Features & Functions											
Control type	On/Off, PID	On/Off, PID	On/Off, PID	On/Off, PID	On/Off, PID	VMD	On/Off, PID	On/Off, PID	On/Off, PID VMD	On/Off, PID VMD	On/Off, PID VMD
Profiler				●				●	●	●	○
Retransmission output				○	○	○		○	○	○	○
Heater break alarm									○	○	○
RS485 Modbus comms	○		○	○	○	○	○	○	○	○	○
Software	MAXVU configurator		CALgrafix	CALgrafix	Plus Series configurator	Plus Series configurator			BlueControl	BlueControl	BlueControl
Power Supply											
110 VAC	○	○	○	●	○	○	○	○	○	○	○
230VAC	○	○	○	●	○	○	○	○	○	○	○
12VAC / DC		○	○				○				
24VAC / DC	○	○	○		○	○	○	○	○	○	○
48V AC / DC					○	○		○			

● = Fitted

○ = Option

(1) 9400 display: 2 x 4 digit LED

MAX*VU*16 & MAX*VU*8 Compact Controller

The MAX*VU* is a cost effective temperature controller which is fast-to-configure, has improved display visibility and with only 70mm depth, reduces costs by minimizing wiring and panel space.

Benefits and features

- 1/16 DIN (48 x 48 mm) and 1/8 DIN (96 x 48 mm) 70mm depth
- Large high visibility LED display
- Universal input for thermocouple, PT100, mV, V and mA sensors
- 2 or 3 outputs
- RS485 Modbus RTU communications
- Heat/cool strategy
- Ramp/dwell with delay time
- Front panel keys or software set up
- CE, UL and cUL

Supply Voltage
- **M** 110 to 240V AC
- **L** 24V AC / DC

Communications
- **0** Not fitted
- **C** RS485 communications

MV	16	0	M	AA0	0	2	1	U0

Format
- **16** 1/16 DIN, 48 x 48mm
- **08** 1/8 DIN, 96 x 48mm

Output

	Out 1	Out 2	Out 3
AA0	SSR	SSR	None
AR0	SSR	Relay	None
RR0	Relay	Relay	None
AAR	SSR	SSR	Relay
ARR	SSR	Relay	Relay
RRR	Relay	Relay	Relay

Manual Language
- **1** English
- **2** French
- **3** German
- **4** Italian
- **5** Spanish
- **6** Simplified Chinese

CAL 3200 Simple PID Temperature Controller

The compact CAL 3200 1/32DIN temperature controller is designed to be easy-to-use and reliable within the most demanding process and manufacturing applications.

Designed for industrial or scientific applications CAL3200 has an impact resistant smoked fascia with large rubberized buttons with positive feedback. PID tuning is simple and efficient whilst the unique dAC function minimizes overshoot.

Benefits and features

- 1/32 DIN (24 x 48 mm) and 1/16 DIN (48 x 48 mm), 102mm depth
- High impact fascia with rubberized buttons
- Thermocouple, PT100 (2 wire) and mV sensor input 2 outputs
- Plug in terminal block
- Simple menu-driven setup
- Heat/cool control strategy
- CE, UL and cUL

Version
0 Standard

32 **0** **0** **4** **0**

Power Supply Options
0 90-260V AC
4 12V AC/DC
5 24V AC/DC

3300, 9300 & 9400 Easy-to-use Controllers

The CAL range provides a choice of compact, impact resistant temperature controllers.
The easy-to-use devices provide essential temperature control functionality including heat/cool operation and a simple ramp/dwell program. There is an integrated auto-tune feature for optimum PID settings and a unique dAC function to minimize overshoot.

Benefits and features

- 1/32 DIN (24 x 48 mm) and 1/16 DIN (48 x 48 mm), 107mm depth
- High impact fascia with rubberized buttons
- Thermocouple, PT100 (2 wire) and mV sensor input
- 2 outputs
- RS232 or RS485 Modbus RTU communications
- Simple menu-driven setup
- Single ramp/soak (dwell) program
- Heat/cool control strategy
- CE, UL, cUL, CSA and FM

Outputs (Reversible)
00 SSd / 2A relay
11 2A relay / 1A relay
22 SSd / SSd

Supply
0 100-240V AC
3 12-24V AC/DC (1)

33	00	00	4	3	0

Model
33 1/32 DIN (48 x 24mm)
93 1/16 DIN (48 x 48mm)
94 1/16 DIN (48 x 48mm) dual display

Comms
0 Not fitted
2 RS232 fitted
4 RS485

(1) Models 3311, 9311, 9400, 9411 and 9422 are not currently available in low voltage 12-24V option.

9500P 1/16 DIN Profiler

The CAL 9500P is ideal for applications requiring fixed value or ramping temperature profiles in a compact 1/16th DIN unit. The programmer allows up to 31 programs with up to an overall total of 126 segments.

Set up of the instrument can be carried out using the front buttons or alternatively with the CALgrafix software. The tool allows quick configuration and is easy to create recipes using the graphical 'drag and drop' feature. Users can also clone parameter settings of one unit to multiple instruments in the same network.

Benefits and features

- 1/16 DIN (48 x 48 mm), 107mm depth
- High impact fascia with rubberized buttons
- Thermocouple, PT100 (2 wire), mA, V and mV sensor input
- 3 outputs
- RS232 or RS485 Modbus RTU communications
- Heat/cool control strategy
- Up to 126 segments shared in up to 31 programs
- Profiler functions include event outputs, loop, call, hold back and 3 power recovery modes
- Simple menu-driven setup
- CE, UL and cUL

Outputs 1 & 2
- **00** SSd / relay
- **11** Relay / relay
- **22** SSd / SSd
- **B1** 4-20mA / relay
- **B2** 4-20mA / SSd
- **C1** 0-5V / relay
- **C2** 0-5V / SSd
- **D1** 0-10V / relay
- **D2** 0-10V / SSd

Inputs
- **A** Sensor (thermocouple or RTD)
- **B** 4-20mA
- **C** 0-5V
- **D** 0-10V

95	00	1	P	B	4	00

Output 3
- **1** Relay

Comms
- **0** Not fitted
- **2** RS232 fitted
- **4** RS485 fitted

6100+, 8100+ & 4100+ Flexible PID Controller

The + series of controllers are used in many temperature and process control applications due to their versatility and ease-of-use. A wide range of input and output options include relay, SSR, transmitter power supply, linear, remote setpoint and digital inputs.

Control functionality includes remote and dual setpoint options, heat/cool control and setpoint ramping.

Benefits and features

- 1/16 DIN (48 x 48 mm), 110mm depth, 1/8 DIN (96 x 48 mm), 100 mm depth and 1/4 DIN (96 x 96 mm), 100mm depth
- Membrane fascia with common + series design
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 4 outputs
- Wide range of options available
- RS485 Modbus RTU communications
- Heat/cool control strategy
- Programming port for fast configuration using FTP software
- CE, UL, cUL and CSA

Option Slot 2
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Triac

Option Slot A
0 Not fitted
1 RS485 communications
3 Digital input
4 Remote setpoint input (Basic)

Display Color
0 Red upper & lower
1 Green upper & lower
2 Red upper, green lower
3 Green upper, red lower

P6101	Z	2	0	1	7	0	2	2	0

6101 6100+
8101 8100+
4101 4100+

Option Slot 1
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Triac

Option Slot 3
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Transmitter power supply

Power Supply
0 100-240V AC
2 24-28V AC or DC

Option Slot B (not on 6101)
0 Not fitted
R Remote setpoint input (full)

6170+, 8170+ & 4170+ Valve Motor Drive Controller

The 6170+, 8170+ and 4170+ have been designed for valve motor drive (VMD) applications. They feature the common + series interface and greater field flexibility.

A unique VMD tuning algorithm continuously monitors the process to provide stable control at all times.

Benefits and features

- 1/16 DIN (48 x 48 mm), 110mm depth, 1/8 DIN (96 x 48 mm), 100 mm depth and 1/4 DIN (96 x 96 mm), 100mm depth
- Membrane fascia with common + series design
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 4 outputs
- Wide range of options available
- RS485 Modbus RTU communications
- Valve Motor Drive control strategy
- Programming port for fast configuration using FTP software
- CE, UL, cUL and CSA

Option Slot A
0 Not fitted
1 RS485 communications
3 Digital input
4 Auxiliary input (Basic)

Option Slot 2
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Triac
9 Dual relay

Display Color
0 Red upper & lower
1 Green upper & lower
2 Red upper, green lower
3 Green upper, red lower

P6171	Z	2	1	1	2	0	2	2	0

6171 6170+
8171 8170+
4171 4170+

Option Slot 1
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Triac

Option Slot 3
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Transmitter power supply

Power Supply
0 100-240V AC
2 24-28V AC or DC

Option Slot B (not on 6171)
0 Not fitted
R Full remote setpoint with digital input

N2300 1/32 DIN Controller

The West N2300 offers flexibility as a controller or an indicator. In addition to the main 4 digit display the N2300 benefits from three multi-color status LEDs for process, alarm and configuration indication.

The large, tactile rubberized keys provide a more practical human interface which is complemented with a specially developed PID tuning algorithm, Easy-Tune, which continuously monitors and improves control. The N2300 indicator has up to two outputs (relay or solid state driver) for alarm.

Benefits and features

- 1/32 DIN (24 x 48 mm), 110 mm depth
- High impact fascia with rubberized buttons
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 3 outputs
- RS485 Modbus communications
- PID control with manual override tune capability for specialized applications
- Simple operation and easy setup
- CE, UL and cUL

Output Type

- **00** Indicator only
- **01** Indicator + alarm 1 (relay)
- **02** Indicator + alarm 1 (SSR)
- **12** Controller (relay) + alarm 1 (SSR)
- **21** Controller (SSR) + alarm 1 (relay)

Display Color & Power Supply

- **0** Green display/100-240V AC supply
- **1** Red display/100-240V AC supply
- **2** Green display/12-30V DC/24V AC supply
- **3** Red display/12-30V DC/24V AC supply

N2301Y **00** **0** **1**

Option

- **0** Not fitted
- **1** Alarm 2 relay output
- **2** RS485 comms

N6400 1/16 DIN Basic Profiler

The N6400 is a powerful, single loop programmable controller. It offers profiling capability with 4 programs each with up to 16 free format segments.

The N6400 is easy-to-use, benefiting from an informative display providing maximum process information at a glance. A dedicated configuration port allows set up directly from a PC.

Benefits and features

- 1/16 DIN (48 x 48 mm), 110 mm depth
- Membrane fascia
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 3 outputs
- RS485 Modbus communications
- Fast and accurate control via raPID fuzzy logic
- Profiler function 4 programs of 16 segments
- 'Auto hold' facility, remote run hold, event output, power failure recovery and guaranteed soak
- CE, UL and cUL

Option Slot 2
- 0 Not fitted
- 1 Relay ctrl, Alarm 2, event or alarm
- 2 DC for SSR control or alarm 2
- 3 DC 0-10V control
- 4 DC 0-20mA control
- 5 DC 0-5V control
- 7 DC 4-20mA control
- 8 Triac control

Power Supply
- 00 100-240V AC/no options
- 02 24-48V AC or DC/no options
- 10 100-240V AC/RS485 comms
- 12 24-48V AC or DC/RS485 comms
- 30 100-240V AC/remote run-hold
- 32 24-48V AC/DC/remote run–hold

Input Type
- 1 3 wire RTD or DC mV
- 2 Thermocouple
- 3 DC mA
- 4 DC voltage

N6401	Z	2	3	0	2	00	S14

Option Slot 1
- 1 Relay control
- 2 DC for SSR control
- 3 DC 0-10V control
- 4 DC 0-20mA control
- 5 DC 0-5V SP control
- 7 DC 4-20mA control

SSR Code
- (blank) Special variant not required
- S14 10V DC SSR outputs (requires SSR output codes)

Option Slot 3
- 0 Not fitted
- 1 Relay ctrl, alarm 1, event or profile active
- 2 DC for SSR alarm 1 output
- 3 DC 0-10V re-transmit PV or SP
- 4 DC 0-20mA re-transmit PV or SP
- 5 DC 0-5V re-transmit PV or SP
- 7 DC 4-20mA re-transmit PV or SP

Pro-16 1/16 DIN Advanced Controller

A compact, fully featured controller for demanding applications.

Pro-16 is the only controller of its size, flexible with up to 6 outputs, 2 digital inputs, a remote setpoint input, RS485 communications and linked to best in class BlueControl© software.

The Pro-16 offers many integrated features for unrivaled performance such as two PID sets to ensure reliable control over a wide setpoint range and separate PID for heat and cool strategies for optimized control and stability. Extensive flexibility is offered with 1 universal input and 1 optional process input, up to 4 digital inputs, 6 outputs and a built-in profiler.

Benefits and features

- 1/16 DIN (48 x 48 mm), 112 mm depth
- Display supports backlight color change and text
- Common West Pro family styling
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 6 outputs
- RS485 Modbus communications
- PID Heat/Cool and VMD control strategies
- Optional heater current or remote setpoint
- Customer specific linearization for sensors
- Transmitter power supply
- Profiler 16 profiles x 16 segments
- CE, UL and cUL

Model
1/16 DIN universal industrial controller

Supply Voltage
- 0 100-240V AC
- 1 24V AC 50/60Hz or 18 to 30V DC

Base Option
- T TPS
- H HC / mA

Option 1
- R Relay (switch over)
- A Single SSR
- Y Dual SSR
- L Linear mA/V DC output

Option 2
- 0 Not fitted
- R Relay
- D Dual relay
- A Single SSR
- Y Dual SSR

Option 3
- 0 Not fitted
- R Relay (changeover)
- A Single SSR
- Y Dual SSR
- L Linear mA/V DC output
- C RS485

Option A
- 0 Not fitted
- C RS485
- B Dual isolated digital input

Language
- 0 No manual
- 1 German
- 2 English
- 3 French
- 4 Italian
- 5 Spanish

KS20 - 1 0 T - R 0 0 C 2 - 0 01

Pro-8 Universal Controller

The Pro-8 devices are intended for universal and precise control tasks in all process applications plus special features for plastics machinery. Embedded monitoring functions supervise sensors and heaters for preventative maintenance.

Benefits and Features

- 1/8 DIN (96 x 48 mm), 118 mm depth
- Common West Pro family styling
- Programmable function key
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Customer-specific linearization for non-standard sensors
- Up to 3 outputs
- RS422/485 Modbus communications
- Optional heater current or remote setpoint
- PID heat/cool control strategy with water cooling
- Front interface and BlueControl© software
- Maintenance manager and error list
- Emergency operation after sensor break using % power output average
- Extended temperature range to 60°C
- CE, UL, cUL and EN 14597

Options
- **0** No option
- **1** Modbus RTU + U_T + di2/3 + OUT5/6
- **8** U_T + di2/3 + OUT5/6

Configuration
- **0** Standard configuration
- **9** Customer specific configuration

Terminal Type
- **1** Screw terminals

KS50 - 1 1 1 - 0 0 0 9 E - U69

Power Supply Outputs
- **0** 90-250V AC, 3 relays
- **1** 24V AC / 18-30V DC, 3 relays
- **2** 90-250V AC, INP2, 2 relays + mA//V/logic
- **3** 24V AC / 18-30V DC, 2 relays + mA/V/logic
- **4** 90-250V AC, 2 relays (Changeover) + mA/V/logic

Pro-4 Advanced Controller

The industrial and process controller Pro-4, takes over automatic control functions in all industrial sectors, precisely and economically. They offer the choice of simple On/Off control, PID control or stepping motor control. A bar-graph / text display provides the user with additional clear messages and process information.

Benefits and Features

- 1/4 DIN (96 x 96 mm), 118 mm depth
- Day/night display with additional text/bar line
- Common West Pro family styling
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Optional second Universal input
- Customer-specific linearisation for non-standard sensors
- Up to 6 outputs
- RS422/485 Modbus or Profibus communications
- PID heat/cool and VMD control strategies
- Front interface and BlueControl© software
- Profiler function 16 programs x 16 segments
- Maintenance manager and error list
- CE, UL, cUL and EN 14597

Serial Interface & Options
- **0** No option
- **1** RS422/485+UT+DI2/3 + OUT5/6
- **8** Profibus-DP + UT + DI2/3 + OUT5/6

Terminal Type
- **1** Screw terminals

Main Function
- **1** Program controller with 8 programs
- **2** Program controller with 16 programs

KS92 - 1 1 1 - 1 0 1 9 E - U69

Power Supply & Outputs
- **0** 90-250V AC, 4 relays
- **1** 24V AC/18-30V DC, 4 relays
- **2** 90-250V AC, 3 relays + mA/logic
- **3** 24V AC/18-30V DC, 3 relays + mA/logic
- **4** 990-250V AC, 2 relays + 2 xmA/logic
- **5** 24V AC/18-30V DC, 2 relays + 2xmA/logic

Configuration
- **0** Standard configuration
- **9** Configuration to specification

Additional Analog Inputs
- **0** INP1 and INP2
- **1** INP1, INP2 and INP3

Multi-loop Panel Mounted Controllers

Model	Pro-EC44	MLC 9000+	KS 98-2	KS Vario
Page Number	17	18	19	21
Control Loops				
Maximum number	2	32	30	30
Format				
1/4 DIN (96 x 96mm) panel mount	●		●	
DIN rail behind panel		●		●
Display				
Display type	Mono LCD	None	Color LCD	None
Connectors				
Screw terminal - fixed	●		●	
Screw terminal - plug In		●		
Spade terminals			o	
Plug in spring terminals				●
Inputs				
Process Inputs	2	32	21	30
Thermocouple/RTD	●	●	o	o
DC Linear V/mA	●	●	o	o
Digital input	9	0	22	5
Remote Setpoint	o	o	o	o
Outputs				
Max. number of outputs	9	48	11	300
Relay	●	o	o	o
SSR driver	o	o	o	o
DC linear	o	o	o	o
Triac	o			
Transmitter PSU	o		o	
Features & Functions				
Control type	On/Off, PID	On/Off, PID	Fully programmable	On/Off, PID
Retransmission outputs	o	o	o	o
Heater break alarm		o	o	o
Logic capability			o	
Software	BlueControl	MLC 9000+ workshop software	ET/KS 98-2 and SIM/ KS 98-2	Blue Control
Communication				
Modbus RTU	o	o	o	o
Profibus		o	o	o
DeviceNet		o		o
CAN open			o	o
Modbus TCP	o	o	o	o
Ethernet IP				o
Profinet			o	o
Power Supply				
110 VAC	o		o	
230VAC	o		o	
24VAC / DC	o	DC only	o	DC only
48V AC / DC	o			

● = Fitted
o = Option

Pro-EC44 Single/Dual Loop Advanced Controller

Pro-EC44 includes many features to ensure good control performance and easy to use. Single or dual loop capability in a single device, cascade, valve and ratio enhanced control with support for advanced features so Pro-EC44 has the flexibility to fit many application needs. In addition datalogging, trending, USB, Ethernet options add even more capability to an already powerful device.

Benefits and features

- 1/4 DIN (96 x 96 mm), 117mm depth
- Graphical/text mono LCD display (red/green backlit LCD)
- 1 or 2 universal inputs for thermocouple, PT100, mV, V and mA sensors
- Customer-specific linearization for non-standard sensors
- Up to 9 outputs
- RS 485 Modbus or Ethernet Modbus TCP communications
- USB configuration and data access
- PID heat/cool and VMD control strategies
- Gain scheduling, ratio and cascade control
- Profiler function 64 programs with up to 255 segments
- Datalogger with real-time clock
- CE, UL, cUL

Plug in Module Slot 1
0 Not fitted
1 Relay output
2 DC drive output for SSR
L Linear DC output
8 Triac output

Base Option 1
1 Relay output
M Relay output + Linear DC output

Unit Type
C Controller
U Controller with USB port
X Controller/ recorder
R Controller/ recorder with USB port

Power Supply
0 100-240V AC
2 24-48V AC or DC

Plug in Module Slot 3
0 Not fitted
1 Relay output
2 DC drive output for SSR
8 Triac output
9 Dual relay output
Y Dual SSR driver output
T 24V DC transmitter power supply

Option C
0 Not fitted
1 Multiple digital input

EC44	0	C	0	0	1	1	0	2	0	0	0	0	1	1

Profiler
0 Not fitted
P Profiler

Control Loops
1 One control loop
A One loop + auxiliary input
2 Two control loops

Base Option 2
0 Not fitted
M Relay output + Linear DC output

Manual & HMI Language
1 English
2 French
3 German
4 Italian
5 Spanish
6 Simplified Chinese

Plug in Module Slot 2
0 Not fitted
1 Relay output
2 DC Drive output for SSR
8 Triac output
9 Dual relay output
Y Dual SSR driver output
T 24V DC transmitter power supply

Plug in Module Slot A
0 Not fitted
1 RS485 serial comms - Modbus RTU
3 Digital input
4 Auxillary input A
5 Ethernet-Port – Modbus TCP

MLC 9000+ Modular Controller System

The MLC 9000+ system comprises of a bus module plus 1 to 8 control modules. 1, 3 & 4 loop control modules are available allowing up to 32 control loops per system. Heater break input is available on 1 and 3 loop modules. Communication modules for connecting to a PLC, HMI, PC or SCADA include Modbus, DeviceNet, Profibus and Modbus TCP.

The MLC 9000+ features a hot swap facility, a module can be replaced and back in service quickly due to automatic reconfiguration.

Benefits and features

- Bus module: 100 x 30 x 120mm format
  Loop module: 100 x 22 x 120mm format (HxWxD)
- Universal (TC, RTD, DC linear V, DC linear mA/mV)
- Up to 48 outputs per system
- Modbus RTU, Modbus TCP, Profibus, DeviceNet communications
- Heat/cool control strategy
- Quick to setpoint and fast reaction to process disturbances
- On-demand and auto-tuning
- Set-up 32 loops in less than 30 minutes
- CE, UL and cUL

Bus Modules

MLC 9000 **BM220** - **MB**

BM220 - MB	Modbus RTU
BM230 - DN	DeviceNet
BM240 - PB	Profibus-DP
BM250 - MT	Modbus/TCP

Loop Modules

MLC 9000 **Z1200** **00**

Z1200	One universal input, two SSR/relay outputs
Z1300	One universal input, two SSR/relay outputs and one linear output or three SSR/relay outputs
Z1301	One universal input, one heater break input, two SSR/relay outputs and one linear output or three SSR/SP relay outputs
Z3611	Three universal inputs, one heater break input, six relay outputs
Z3621	Three universal inputs, one heater break input, six SSR outputs
Z3651	Three universal inputs, one heater break input, six outputs (three SSR/three relay)
Z4660	Four universal inputs, six outputs (four SSR/two relay)
Z4610	Four universal inputs, six relay outputs
Z4620	Four universal inputs, six SSR outputs

KS 98-2 Multi-function Controller

PMA's multi-function instrument KS 98-2 combines PID control, process monitoring, sequence control, data logging and alarms.

Function blocks from an extensive library can be used to build an application by easily selecting and connecting the blocks graphically using the "ET/KS98"-utility. This method is ideal for creating tailored control, including user interface pages with minimal effort. As a complete solution in a single unit, the KS 98-2 multi-function instrument helps to reduce programming, installation cost and control cabinet space.

Benefits and features

- Modular automation system in a 1/4-DIN (96 x 96mm), 118 mm depth
- 3.5 " color touch-screen display
- Universal Input (TC, RTD, DC linear mA/mV)
- Expandable with modular inputs and outputs
- Up to 20 additional process inputs
- Up to 26 outputs
- Ethernet, USB, CAN, RS485, Profibus DP, Profinet
- Measure, control, calculate, and record
- Process visualization, operation, alarm and alerts
- Comprehensive application-oriented functionality
- Graphical programming utility with simulator
- CE, cULus, DIN EN 14597

Communication Options [D]
- 0 None / for stand alone applications
- 1 Standard interfaces (Ethernet/USB and CAN for Remote I/O)
- 2 Standard interfaces plus RS485 / Modbus
- 3 Standard interfaces plus Profibus
- 4 Standard interfaces plus Profinet

Base Models (1)
- 0 Fast-on terminals
- 1 Screw terminals

I/O Extensions [B]
- 0 Not fitted
- 1 Digital-I/O extension (10 DI, 4 DO)
- 2 Modular extension (4 option module slots)

Configuration
- 0 Default settings; No option modules installed
- 1 Default settings; Option modules according to additional order line
- 8 Preset to specification; No option modules installed
- 9 Preset to specification; Option modules according to additional order line

KS98 - 2 1 0 - 1 0 1 2 0 - U 0 0

Power Supply & Outputs [P]
- 0 90...250V (2 relays, 2 option module slots)
- 1 24V UC (2 relays, 2 option Slots)
- 2 90...250V (4 relays)
- 3 24V UC (4 relays)

Options
- 0 None
- 1 Datalogger

I/O Extensions [C]
- 0 Not fitted
- 1 Digital-I/O extension (10 DI, 4 DO)
- 2 Modular extension (4 option module slots)

Certification
- 0 Standard (CE certified)
- U UL / cUL certified
- D DIN3440 / EN 14597

(1) Universal Input, 2 digital inputs, TPS, 2 option module slots

KS 98-2 Multi-function Controller

KS 98-2 offers comprehensive modular input and output options to adapt the unit to the application needs. The unit is optimized to handle the precise measurements required in the process industry via I/O modules supporting a variety of sensor types and also have galvanic isolation. Additional signal conditioners and isolating amplifiers are not necessary in most applications, saving cost and less installation.

Hardware flexibility

- Unprecedented number of I/O in a 1/4-DIN device
- Fully adaptable with up to 12 internal I/O-modules
- Almost every 1/4 DIN controller can be replaced/upgraded

KS 98-2 Option Modules

To be installed into KS98-2 in order line above
Please indicate for all option module slots (12 digits)

A98	-	Factory installed	-	Strip P / Segment 3	Strip P / Segment 4	Strip A / Segment 2	Strip A / Segment 3	Strip B / Segment 1	Strip B / Segment 2	Strip B / Segment 3	Strip B / Segment 4	Strip C / Segment 1	Strip C / Segment 2	Strip C / Segment 3	Strip C / Segment 4
		F		0	0	0	0	0	0	0	0	0	0	0	0

Modules and Positions

0 0 0 0 0 0 0 0 0 0 0 0	Not fitted
- - U U U U U U U U U U	Universal input
- - R R R R R R R R R R	Dual Pt100/1000, Ni100/1000, resistance
- - T T T T T T T T T T	Dual Thermocouple, mV, 0/4...20mA
- - V V V V V V V V V V	Dual -50...1500mV (eg. Zirconia probe), 0...10V
- - P P P P P P P P P P	0/4...20mA Input with transmitter power supply
A A A A A A A A A A A A	Dual DC drive output for SSR
L L L L L L L L L L L L	Dual linear out (mA/V DC)
B B B B B B B B B B B B	Dual bipolar linear out (-10V…10V)
- - D D D D D D D D D D	Dual digital I/O

Separate Module Orders

A98	-	M	-	U

Available modules

U	Universal input
R	Dual Pt100/1000, Ni100/1000, resistance
T	Dual thermocouple, mV, 0/4...20mA
V	Dual -50...1500mV (eg. Zirconia probe), 0...10V
P	0/4...20mA input with transmitter power supply
A	Dual DC drive output for SSR
L	Dual linear out (mA/V DC)
B	Dual bipolar Linear Out (-10V…10V)
D	Dual digital I/O

KS Vario Modular I/O Multi-loop Control System

The KS vario behind panel multi-loop controller system was specifically developed for machine temperature control in combination with PLC systems. To ensure easy integration to wider plant systems, many common fieldbus systems are supported.

By selecting the necessary I/O modules, the system can be configured for up to 30 control loops very economically and in precise increments.

Benefits and features

- Remote I/O style mechanical design - Single module 12.2 x 120 x 71.5mm
- Up to 30 process inputs for thermocouple, PT100, mV, V and mA sensors
- Variety of outputs for control and alarms
- RS485 Modbus, Ethernet Modbus TCP, Profibus, Profinet, Ethernet/IP and CAN open communications
- PID control loops can be assigned to process inputs
- Additional process measurements and signals can be integrated
- Highly modular expansion
- Heater current monitoring
- CE, UL, cUL and CSA

For full dimensions see datasheet

Buscoupler

KSVC - 1 0 1 - 0 0 1 1 1 - U 00

Option

- 1 Profibus-DP/V1
- 2 CAN open
- 3 Modbus TCP
- 5 Modbus RTU
- 7 Profinet
- 8 Ethernet IP

Controller

Protocol

- 0 For Ethernet Mod/TCP, Ethernet IP, Profibus, Modbus, Profinet
- 2 For CAN open

KSVC - 1 0 4 - 0 0 33 1 - U 00

Option

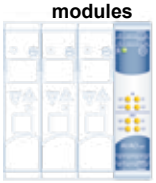
- 33 KS VARIO T4/RTD: Vario temperature controller, 4-channel, spring-clamp connection, labeling field, 4 inputs, RTD (resistance element), 3 wire connection + screening, 6 outputs 24 V DC, 1 heating current input, I/O extensible
- 43 KS VARIO T4/UTH: Vario temperature controller, 4-channel, spring-clamp connection, labeling field, 4 inputs, TC (thermocouples), 2 wire connection + screening, 8 outputs 24 V DC, 1 heating current input, I/O extensible
- 34 KS VARIO T6/RTD: Vario temperature controller, up to 30-channel, spring-clamp connection, labeling field, 6 inputs, RTD (resistance element), 3 w ire connection + screening, 6 outputs 24 V DC, 1 heating current input, I/O extensible up to 30 channels
- 44 KS VARIO T8/UTH: Vario temperature controller, up to 30-channel, spring-clamp connection, labeling field, 8 inputs, TC (thermocouples), 2 wire connection + screening, 8 outputs 24 V DC, 1 heating current input, I/O extensible up to 30 channels

I/O Extension

KSVC - 1 0 x - 0 x x x 1

For a full list of available modules please refer to the KS Vario price list or visit **www.west-cs.com** to get in contact.

DIN Rail Panel Mounted Controller

Model	MAXVU Rail	KS 45	CI 45	SG 45	Rail Line I/O modules
					
Device Type	Controller/Transmitter	Controller	Transmitter	Strain Gauge Transmitter	I/O
Page Number	23	25	26	26	27
Dimensions (mm)					
Height	107	99	99	99	99
Width	22	22	22	22	22
Depth	123	117	117	117	117
Display					
Display type	OLED	LCD	LCD	LCD	LED indicator
Connectors					
Screw terminal - plug in	o	o	o	o	o
Spring terminal - plug-in	o	o	o	o	o
Inputs					
Thermocouple/RTD	●	●	●		o
DC linear V/mA	●	●	●		o
Strain gauge				●	
Digital inputs	●				
Remote setpoint		●			o
Outputs					
Max. number of outputs	3	3	3	2	8 per module
Relay	o	o	●		o
SSR driver	o	o	●		o
DC linear	o	o			o
Triac					
Transmitter PSU		o		●	
Features & Functions					
Control type	On/Off, PID	On/Off, PID	Measurement and alarm	Measurement and alarm	
Max. number of alarms	2	3	3	3	
Retransmission output	o	o	o	o	
Heater break alarm					
Software	MAXVU configurator	BlueControl	BlueControl	BlueControl	BlueControl
Communication					
Modbus RTU	o	o	o	o	
Buscoupler module support (for major Fieldbus)		o	o	o	o
Power Supply					
110 VAC	o	o	o	o	
230VAC	o	o	o	o	
24VAC / DC	o	o	o	o	●

● = Fitted
o = Option

MAX*VU* Rail Behind Panel Controller

MAXVU Rail is a compact DIN-rail mount temperature controller/transmitter and limiter range for general industrial and scientific equipment requiring a reduced back panel footprint, centralized control or minimal front panel components.

Benefits and features

- DIN rail mounted, 107 x 22 x 103mm (HxWxD)
- OLED text/icon matrix display
- Thermocouple, PT100 or linear DC sensor input
- Isolated digital input
- Up to 3 outputs
- RS485 Modbus RTU communications
- Heat/cool control strategy
- Quick setup menu
- Front configuration port
- CE, UL & cUL

MAXVU Rail Controller / Transmitter

MVR	1	0	M	ZA0	0	5	1	U0

Digital Input
1 Isolated

Variant
0 Standard
E Extrusion

Supply Voltage
M 110 to 240V AC
L 24V AC / DC

Output

	Out 1	Out 2	Out 3
ZA0	C/O Relay	SSR	None
ZR0	C/O Relay	Relay	None
AA0	SSR	SSR	None
ZAR	C/O Relay	SSR	Relay
ZRR	C/O Relay	Relay	Relay
AAR	SSR	SSR	Relay
ZAL	C/O Relay	SSR	Linear
ZRL	C/O Relay	Relay	Linear
AAL	SSR	SSR	Linear

Option Slot 2
0 Not fitted
C RS485 communications

Manual Language
1 English
2 French
3 German

Terminal Type
U0 Screw terminals
00 - S419 Spring terminals

Rail Line Process Instrumentation System

Rail Line offers high accuracy measurement modules and independent control, monitoring and limiter modules for decentralized automation installations. It provides connectivity to the common field bus systems.

Benefits and features

- DIN rail mounted, 96 x 22.5 x 117.5mm (HxWxD)
- Field bus coupler for Profibus, CAN, Modbus TCP, Modbus RTU and Profinet
- Up to 62 modules in a system
- Configurable fail safe mode
- Stand alone function modules
- Hot swap capability
- Plug-in terminals
- CE, UL & cUL

Field bus couplers

- Profibus DP
- Profinet IO
- Modbus/TCP
- CAN open
- Modbus RTU
- And additional power supply for large systems

Certification
0 None
U UL/cUL certified

Connector
0 Without terminal blocks
1 Screw terminal
2 Spring-clamp terminal

RL40 - 1 1 2 - 00000 - U 00

Option
1 CAN open
2 Profibus DP/DPV1
3 Modbus RTU
4 Ethernet Modbus/TCP
5 Profinet IO
9 Power supply module 24V

KS 45 Rail Line Universal Controller

The KS 45 process controller is a stand alone version for direct connection via RS485 Modbus or system version with buscoupler and inter-module connections permit additional controllers, transmitters and limiters to be fitted without additional power or communications wiring.

Benefits and features

- DIN-Rail Mounted 99mm x 22.5mm x 117.5mm (HxWxD)
- LCD configuration and status display
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Optional second universal input
- 3 outputs including one universal output
- RS485 Modbus RTU or system fieldbus communications
- PID heat/cool and VMD control strategies
- Fast sampling rate
- Timer and programmer
- Customer-specific linearization for non-standard sensors
- CE, UL, cUL and type tested to EN 14597

Option
- 0 No option
- 1 RS485 / Modbus - protocol
- 2 System interface (only for 24V versions)

Connector
- 0 Without plug-in connector terminals
- 1 With screw terminal connector
- 2 With spring clamp terminals

Certification
- 0 Standard (CE-certification)
- D DIN 3440 / EN 14597
- U Ul/cUL certified

KS45	-	1	0	1	-	2	0	0	9	0	-	U	00

Configuration
- 0 Standard configuration
- 9 Customer-specific configuration

Power Supply Outputs
- 0 90-260V AC, 2 output relays, INP2 as current input (0-20mA)
- 1 18-30V AC/18-31V DC, 2 output relays INP2 as current input (0-20mA)
- 2 90-260V AC, mA/V/logic + 2 relays, INP2 as current input (0-20mA)
- 3 18-30V AC/18...31V DC, mA/V/logic + 2 relays, INP2 as current input (0-20mA)
- 4 90-260V AC, 2 optocoupler outputs, 1 relay, INP2 as current input (0-20mA DC and 0-50 mA AC)
- 5 18-30V AC/18..31V DC, 2 optocoupler outputs, 1 relay, INP2 as current input(0-20mA DC and 0-50 mA AC)

Input
- 0 di1 as contact input
- 1 di1 as optocoupler input
- 2 INP2 as universal input, 0_2 -measurement, di1 as contact input (1)
- 3 INP2 as universal input, 0_2 -measurement, di1 as optocoupler input (1)

(1) Not on versions with optocoupler outputs (KS45-1x4... and KS45-1x5...)

CI 45 & SG 45 Rail Line Transmitter

High accuracy transmitters, stand alone version for direct connection via RS485 Modbus or system version with buscoupler and inter-module connections permit additional controllers, transmitters and limiters to be fitted without additional power or communications wiring.

CI 45 Universal Transmitter

Benefits and features

- DIN-Rail Mounted 99mm x 22.5mm x 117.5mm (HxWxD),
- LCD configuration and status display
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Optional second universal input
- 3 outputs including one universal output
- Counter/frequency input, frequency output
- RS485 Modbus RTU or system fieldbus communications
- User input calibration
- Slave pointer (min/max indicator)
- Fast sampling rate
- Customer-specific linearization for non-standard sensors
- CE, UL and cUL

Connector
- 0 Without plug-in connector terminals
- 1 With screw terminal connector
- 2 With spring clamp terminals

Option
- 0 No option
- 1 RS485 / Modbus - protocol
- 2 System interface (only for 24V versions)

Certification
- 0 Standard (CE-certification)
- U UI/cUL certified

CI45	-	1	0	2	-	2	0	0	9	0	-	U	00

Power Supply & Control Outputs
- 2 90-260V AC, mA/V/logic +1 relay
- 3 18-30V AC/18-31V DC, mA/V/logic +1 relay
- 4 90-260V AC, mA/V/logic +2 relay
- 5 18-30V AC/18-31V DC, mA/V/logic +2 relay

Option
- 0 No option
- 1 Option package 1 (1)
- 2 Option package 2 (2)

Configuration
- 0 Standard configuration
- 9 Customer-specific configuration

SG 45 Strain Gauge Transmitter

Benefits and features

- Special-purpose transmitter for strain gauge input
- Mechanics, user interface and communications as KS 45
- 24 bit measuring bridge input
- 2 relay outputs
- Voltage supply for the strain gauge bridge
- Simple scaling during commissioning
- 4 or 6-wire connection for force measurement
- CE, UL and cUL

Option
- 0 No option
- 1 RS485 / Modbus - protocol
- 2 System interface (only for 24V versions)

SG45	-	1	0	2	-	2	0	0	9	0	-	U	00

Connector
- 0 Without plug-in connector terminals
- 1 With screw terminal connector
- 2 With spring clamp terminals

Power Supply & Control Outputs
- 4 90-260V AC, mA/V/logic +2 relay
- 5 18-30V AC/18.-31V DC, mA/V/logic +2 relay

Certification
- 0 Standard (CE-certification)
- U UI/cUL certified

Configuration
- 0 Standard configuration
- 9 Customer-specific configuration

(1) Option package 1: additional universal input INP2, plus: O2-measuring; counter input; functions tare, sample & hold and integrator
(2) Option package 2: additional to option package 1: digital input as optocoupler and frequency input / output

Rail line data acquisition modules

Rail Line offers a variety of sophisticated I/O modules for data acquisition and monitoring. They can be used in combination with the specialized function modules or just as remote I/O.

Benefits and features

- DIN-rail mounted 99mm x 22.5mm x 117.5mm (HxWxD)
- LED indicators for status
- Digital and analog input & output modules
  - Pt 100 in 2 or 4-wire connection
  - Thermocouples
  - mA/V
  - Relays
  - Potential-free digital inputs
  - NPN/PNP inputs
- Fits with system fieldbus communications
- High precision analog signals
- Reinforced galvanic isolation
- Linearization and measured value correction
- CE, UL and cUL

Analog Inputs

4220	**RL 422-0** Analog inputs, 4 x I / U / TPS /potentiometer
4221	**RL 422-1** Analog inputs 2 x I/U galv. isolated
4230	**RL 423-0** RTD 4 x Pt100 galvanic isolated
4231	**RL 423-1** RTD 4 x Pt1000 galvanic isolated
4232	**RL 423-2** RTD 4 x Pt100/Pt1000
4233	**RL 423-3** RTD 2 x Pt100 galvanic isolated
4240	**RL 424-0** 2 x TC galvanic isolated
4241	**RL 424-1** 2 x TC / O2 (mV)
4242	**RL 424-2** 4 x TC galvanic isolation 2/2
4610	**RL 461-0** Combi module, 2 x AI (±U / ±I, 16 Bit) differential inputs; 2 x AO (±U / ±I, 12 Bit)

Digital Inputs

4420	**RL 442-0** Digital inputs 2 x 4 24 V DC (pnp /contact, potential-free)
4421	**RL 442-1** Digital inputs 2 x 4 24 V DC (npn /contact, potential-free)
4422	**RL 442-2** Digital inputs 8 x 1 24 V DC (individual supply)
4430	**RL 443-0** 4 x Digital inputs (115/230V AC)

Connector

0	Without terminal blocks
1	Screw terminal
2	Spring-clamp terminal

Certification

0	Standard (CE-certification)
U	UI/cUL certified

RL40 - 1 0 0 - 0000 0 - U 00

Analog Outputs

4310	**RL 431-0** 4 x I / U (±10V / ±20mA, 12 Bit)
4610	**RL 461-0** Combi module, 2 x AI (±U / ±I, 16 Bit) differential inputs; 2 x AO (±U / ±I, 12 Bit)

Digital Outputs

4510	**RL 451-0** Digital outputs 2 x 4 24 V DC/2A
4511	**RL 451-1** Digital outputs 2 x 4 24 V DC/2A (free wheeling diode)
4520	**RL 452-0** Relay outputs 4 x 230 V DC/5A

Panel Mounted Indicators

Model	6010+ & 8010+	D280-1	EI2410	EI2041
Family	+ series	Blueport	Thermostat	Thermostat
Page Number	29	30	31	31
Front Format				
Thermostat format (29 x 71mm)			●	●
1/32 DIN (24 x 48mm)				
1/16 DIN (48 x 48mm)	o			
1/8 DIN horizontal (48 x 96mm)	o	●		
Depth	110mm / 100mm	118mm	71mm	71mm
Display				
Display type	4 digit LED	5 digit LED	4 digit LED	4 digit LED
Connectors				
Screw terminal	●	o	●	●
Spade terminals		o		
Inputs				
Thermocouple/RTD	●	●		
DC linear V/mA	●	●		●
NTC			●	
Outputs				
Max. number of outputs	3	3	0	2
Relay	o	o		o
SSR driver	o			
DC linear	o	o		
Triac	o			
Transmitter PSU	o	o		●
Features & Functions				
Alarm	●	●	Visual display only	●
Retransmission output	o	o		
RS485 communications	o	o		o
Software	Plus Series configurator	BlueControl		
Power Supply				
110 VAC	o	o	o	o
230VAC	o	o	o	o
12VAC / DC			o	o
24VAC / DC	o	o	o	o
48V AC / DC	o			

● = Fitted
o = Option

6010+ & 8010+ Process Indicators

The 6010+ and 8010+ digital panel process indicators are designed for optimal ease of use in a wide variety of temperature and related process applications.

Output options allow for PV retransmission or transmitter power supply and up to 4 alarm relays (latching or non-latching).

Benefits and features

- 1/16 DIN (48 x 48 mm), depth 110mm
  and 1/8 DIN horizontal (48 x 96 mm), depth 100 mm
- Membrane fascia with common + series design
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 4 outputs
- RS485 Modbus RTU communications
- Latching or non-latching alarm outputs
- Programming port for fast configuration using FTP software
- Multi-point scaling and tare features
- CE, UL, cUL and CSA

Option Slot 2
0 Not fitted
1 Relay
2 DC for SSR
7 Linear DC
8 Triac
9 Dual Relay

Power Supply
0 100-240V AC
2 24-48V AC or DC

P6011	Z	2	0	2	0	1	2	0

Model
6011 6010+
8011 8010+

Option Slot 1
0 Not fitted
1 Relay
2 DC for SSR
7 Linear DC
8 Triac

Option Slot 3
0 Not fitted
1 Relay
2 DC for SSR
7 Linear DC
8 Transmitter power supply
9 Dual relay (8010+ only)

Option Slot A
0 Not fitted
1 RS485 communications
3 Digital input

Display Color
0 Fixed red
1 Fixed green
4 Red/green color change (8010+ only)

D280-1 5-Digit Process Indicator

The PMA Digital 280-1 indicator ensures a fast reaction time with a scan rate of 100 ms.

The instrument offers customer-specific linearization for special sensors (16 segments). The maximum and minimum values are stored and can be displayed when needed. In addition to an indicator the Digital 280-1 can also be used as a controller.

Benefits and features

- 1/8 DIN (horizontal - 48 x 96 mm), 118mm depth
- 5-digit, 20mm large display
- Common BluePort family styling
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 3 outputs
- RS485 Modbus RTU communications
- BluePort® front interface and BlueControl© software
- Maintenance manager and error list
- Widely configurable alarms
- CE, UL and cUL

Options
- 0 No option
- 1 Modbus RTU + transmitter power supply + digital input di2, di3 (optical coupler)

Manual Language
- 0 No manual
- D German
- E English
- F French
- R Russian

D280 - 1 1 0 - 0 00 9 0 - U 00

Power Supply
- 0 90-250V AC
- 1 24V AC / 18-30V DC
- 2 90-250V AC, 2 relays +mA/V/logic
- 3 24V AC / 18..30V DC, 2 relays +mA/V/logic

Configuration
- 0 Standard configuration
- 9 Customer specific configuration

Certification
- 0 Standard (CE - Certified)
- U cULus-certified (with screw terminals only)

EI2410 & EI2041 Basic Indicators

Compact digital indicators for temperature and process measurement.

EI2410 offers temperature indication within a range of -60 to 150°C using a NTC sensor.

EI2041 rescales linear DC signals to display process data in the required units.

EI2410

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- NTC sensor input
- Zero point shift input calibration
- Temperature units selection °F or °C
- Min and max values can be stored
- Upper and lower adjustable alarm limits
- CE

EI2041

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- Input types (0-20mA, 4-20mA, 0-1V, 0-10V)
- Up to 2 relay outputs
- Scale adjustable between -1999 and 4000
- Adjustable decimal point with process units
- Min and max values can be stored on the display
- RS485 Modbus RTU communications
- Alarm function
- TPS output
- CE

EI2410

Voltage
230 230V AC
024 24V AC/DC
012 12V AC/DC

EI2410 | 230 | F

Units
(blank) Centigrade
F Fahrenheit

EI2041

Voltage
230 230V AC
024 24V AC
012 12V AC
SM 9-30V DC / 7-24V AC

Sensor Supply Output
(blank) Not fitted
12 12V DC 50mA
08 08V DC 50mA
05 05V DC 50mA

EI2041 | 230 | 2R | 12 | RS

Relay
(blank) Not fitted
2R 8A output

Modbus Selection
(blank) Not fitted
RS Communication

Limit and Monitor Devices

Model	MAXVU Rail Limiter	6700+, 8700+ & 4700+	TB 45	TB 40-1	STB 50	STB 55
Family	MAXVU	+ Series	Rail Line	Blue Port		
Page Number	33	34	35	36	37	38
Format						
1/16 DIN (48 x 48mm)		●				
1/8 DIN (96 x 48mm)		●		●		
1/4 DIN (96 x 96mm)		●			●	
DIN rail behind panel	●		●			●
Depth (inside panel)	123mm	110mm / 100mm	118mm	118mm	119mm	110mm
Display						
Display type	OLED	2 x 4 digit LED	LCD	2 x 4 digit LED	LCD	LCD
Connectors						
Screw terminal - fixed		●		o		o
Screw terminal - plug-in	●		o			
Faston terminals				o		
Spring clamp terminal			o		●	
Inputs						
Thermocouple/RTD	●	●	●	●	●	●
DC Linear V/mA	●	●	●	●		
Digital Inputs	1	1 or 2	1	1 or 3	1	1
Outputs						
Max. Number of Outputs	3	3	3	3	3	3
Relay	●	●	●	●	●	●
SSR Driver	o	o				
DC Linear	o	o	●	●	●	●
Triac		o				
Transmitter PSU		o				
Certification						
FM	●	●				
EN14597			●	●	●	●
SIL2					●	●
Features & Functions						
RS485 Communications	o	o	o	o		
Software	MAXVU Configurator	Plus Series Configurator	BlueControl	BlueControl		
Power Supply						
110 VAC	o	o	o	o	o	o
230VAC	o	o	o	o	o	o
24VAC / DC	o	o	o	o	o	o

● = Fitted
o = Option

MAX*VU* Rail Behind Panel Temperature Limiter

MAXVU Rail is a compact DIN-rail mount temperature limiter for equipment requiring a reduced back panel footprint, centralized control or minimal front panel components.

Benefits and features

- DIN rail mounted, 107 x 22 x 103mm (HxWxD)
- OLED Text / Icon matrix display
- Thermocouple, PT100 or linear DC sensor input
- Isolated digital input
- Up to 3 outputs
- RS485 Modbus RTU communications
- Limit alarm plus separate warning
- Quick setup menu
- Front configuration port
- CE, UL & cUL & FM

Limit Device Approval: FM

MAXVU Rail Limiter

Supply Voltage
- M 110 to 240V AC
- L 24V AC / DC

Option Slot 2
- 0 Not fitted
- C RS485 communications

MVR	1	T	M	ZA0	0	5	1	U0

Digital Input
- 1 Isolated

Output

	Out 1	Out 2	Out 3
ZR0	C/O Relay	Relay	None
ZRR	C/O Relay	Relay	Relay
ZAL	C/O Relay	SSR	Linear
ZRL	C/O Relay	Relay	Linear
ZA0	C/O Relay	SSR	None
ZAR	C/O Relay	SSR	Relay

Terminal Type
- U0 Screw terminals
- 00 - S419 Spring terminals

Manual Language
- 1 English
- 2 French
- 3 German

The + series of limiter are used in a broad range of temperature control applications where independent protection is required.

The devices have commonality with the + series controllers in both styling and operation so can both easily be integrated within the same equipment.

Benefits and features

- 1/16 DIN (48 x 48 mm), 110mm depth, 1/8 DIN (96 x 48 mm), 100 mm depth and 1/4 DIN (96 x 96 mm), 100mm depth
- Membrane fascia with common + series design
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 3 outputs
- Wide range of options available
- RS485 Modbus RTU communications
- Limit alarm plus separate warning
- Programming port for fast configuration using FTP software
- CE, UL, cUL, CSA and FM

Limit Device Approval: FM

Option Slot A
0 Not fitted
1 RS485 communications
3 Digital input

Option Slot 2
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Triac

Display Color
0 Red upper & lower
1 Green upper & lower
2 Red upper, green lower
3 Green upper, red lower

P6701	Z	2	1	1	2	0	2	2

6701 6700+
8701 8700+
4701 4700+

Option Slot 3
0 Not fitted
1 Relay
2 DC for SSR
7 DC linear
8 Transmitter power supply

Power Supply
0 100-240V AC
2 24-28V AC or DC

TB 45 Behind Panel Temperature Limiter

The TB 45 temperature monitor/limiter offers a stand alone version for direct connection via RS485 Modbus or system version with buscoupler and inter-module connections which permit additional controllers, transmitters and limiters to be fitted without additional power or communications wiring.

Benefits and features

- DIN-Rail Mounted 99mm x 22.5mm x 117.5mm (HxWxD),
- LCD configuration and status display
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Optional second input
- 2 alarm outputs and retransmission output
- RS485 Modbus RTU or system fieldbus communications
- Limit alarm plus separate warning
- Meets requirement of TB and TW to EN14597
- CE, UL and cUL

See other Rail Line products on page 24.

Limit Device Approval: EN14597 TB & TW

Connector
- 0 Without plug-in connector terminals
- 1 With screw terminal connector
- 2 With spring clamp terminals

Option
- 0 No option
- 1 RS 485 / Modbus - protocol
- 2 System interface (for 24V versions only)

Certification
- 0 Standard (CE-certification)
- U UI/cUL certified
- D DIN 3440 / EN 14597

TB45 - 1 0 2 - 1 0 0 9 0 - U 00

Model
- 1 Standard
- 2 DIN approved limiter with dual-TC input

Configuration
- 0 Standard configuration
- 9 Customer-specific configuration

Power Supply & Control Outputs
- 0 90-260V AC, 2 relays
- 1 18-30V AC/18-31V DC, 2 relays
- 2 90-260V AC, mA/V/logic +2 relays
- 3 18-30V AC/18-31V DC, mA/V/logic +2 relays

Input
- 0 di1 as contact input
- 1 di1 as optocoupler input
- 2 INP2 as universal input, 0_2 -measurement, di1 as contact input (1)
- 3 INP2 as universal input, 0_2 -measurement, di1 as optocoupler input (1)

(1) Only available on standard version (model = 1).

TB 40-1 Panel Mount Temperature Limiter

The TB40-1 limiter is used in a broad range of temperature control applications including furnaces and steam equipment where independent protection is required.

The devices have commonality with the BluePort controllers in both styling and operation so can easily be integrated within the same equipment.

Benefits and features

- 1/8 DIN (horizontal - 48 x 96 mm), 1/8 DIN (96 x 48 mm) and 1/4 DIN (96 x 96 mm), 118 mm depth
- Common BluePort family styling
- Universal input for thermocouple, PT100, mV, V and mA sensors
- Up to 3 outputs
- RS 422/485 Modbus communications
- BluePort® Front interface and BlueControl© software
- Limit alarm plus separate warning
- Meets requirement of TB and TW to EN14597
- CE, UL and cUL

Limit Device Approval: EN14597 TB & TW

Power Supply
- 0 90-250V AC, 3 relays, temperature monitor
- 1 24V AC / 18-30V DC, 3 relays, temperature monitor
- 2 90-250V AC, 2 relays, temperature limiter (1)
- 3 24V AC / 18-30V DC, 2 relays, temperature limiter (1)

Manual Language
- 0 No manual
- D German
- E English
- F French

TB40 - 1 0 0 - 0 00 9 0 - U 00

Connector
- 0 Flat pin connectors
- 1 Screw terminal connectors

Configuration
- 0 Standard configuration
- 9 Customer specific configuration

Certification
- 0 Standard (CE - Certified)
- U cULus-certified (2)
- D EN14579 replaces (DIN3440) Certified

(1) TB (EN14597, 2009-1), not available with cULus
(2) With screw terminals only, not available as Temperature limiter TB (EN14597, 2009-1)

STB 50 Panel Mount Safety Limiter

The STB50 safety temperature limiter is used as a panel mounted device when thermal processes must be monitored and the system must be transferred into a safe operational state in case of fault.

Benefits and features

- 1/8 DIN (96 x 48 mm), 119 mm depth
- Graphic-LCD-display, with white LCD-backlight
- Inputs RTD Pt100 or double-thermocouple
- 2 alarm outputs and retransmission output
- Useable as limiter and exhaust gas limiter
- Safety limit alarm plus separate warning
- Memory function for error message
- Certified according to DIN EN 14597 SIL2

Limit Device Approval:
SIL2, EN14597

Output
2 2 relays and 1 analogue output

STB50 - 1 2 1 0 - 000

Device type/Input
1 Pt100, 3-wire, -100.0…+600.0 °C
5 Thermocouple
J (Fe-CuNi), -100.0…800.0 °C
K (NiCr-Ni), -150…1200 °C
N (NiCrSi-NiSi), -150…1200 °C
S (Pt10Rh-Pt), 0...1600 °C

Supply voltage
0 230 V AC, ± 10% 50-60 Hz
1 115 V AC, ± 10 % 50-60 Hz
4 24 V AC, ± 10 % 50-60 Hz
5 24 V DC, ± 15 %

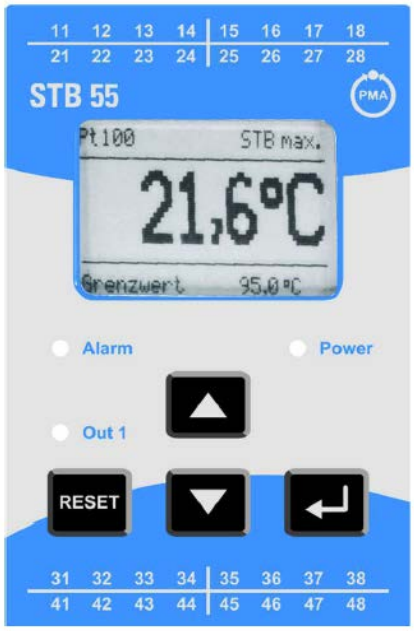
STB 55 Behind Panel Safety Temperature Limiter

The STB55 safety temperature limiter is used as a behind panel device when thermal processes must be monitored and the system must be transferred into a safe operational state in case of fault.

Benefits and features

- Rail Mounted (100 x 50 mm), 110 mm depth
- Graphic-LCD-display, with white LCD-backlight
- Inputs RTD Pt100 or double-thermocouple
- 2 alarm outputs and retransmission output
- Useable as limiter and exhaust gas limiter
- Safety limit alarm plus separate warning
- Memory function for error message
- Certified according to DIN EN 14597 SIL2

Limit Device Approval:
SIL2, EN14597



Output
0 Relay
2 Relay and 1 analogue output

STB55 - 1 0 0 0 - 000

Device type/Input
1 Pt100, 3-wire, -100.0…+600.0 °C
5 Thermocouple
J (Fe-CuNi), -100.0…800.0 °C
K (NiCr-Ni), -150…1200 °C
N (NiCrSi-NiSi), -150…1200 °C
S (Pt10Rh-Pt), 0...1600 °C

Supply voltage
0 230 V AC, ± 10 % 50-60 Hz
1 115 V AC, ± 10 % 50-60 Hz
4 24 V AC, ± 10 % 50-60 Hz
5 24 V DC, ± 15 %

Digital Thermostats

Model	ET2001 & ET2011	ET2411 & ET2412	EDT2411, EDT2412 & EDT2423	ETM2432 Timer
Page Number	40	41	41	42
Display				
Display type	1 x 4 digit LED	1 x 4 digit LED	1 x4 digit LED	1 x 4 digit LED
Single line	●	●	●	●
Connectors				
Screw terminal	●	●	●	●
Inputs				
J Thermocouple	o			
PT100	o			
NTC		●	●	
Digital Input				3
Outputs				
Max. Number of Outputs	2	2	3	2
Relay	●	●	●	●
SSR	o			
Features & Functions				
Control type	On/Off, PID	On/Off	On/Off	Timed relay
Defrost function			●	
RS485 Communications			o	
CAL-key programming			o	
Power Supply				
110 VAC	o	o	o	o
230VAC	o	o	o	o
12VAC / DC	o	o	o	o
24VAC / DC	o	o	o	o

● = Fitted
o = Option

ET2001 & ET2011 Industrial Digital Thermostats

The CAL thermostat range is a complete family of small format devices for basic heating or cooling applications.

The ET thermostats are cost-effective thermostat devices for both industrial heating or cooling applications, two output version also includes alarm function.

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- J Thermocouple, PT100 (ET2011 only)
- Up to 2 outputs
- High current relay output available
- Heating or cooling control strategy
- On/Off or PID (ET2011) Control
- CE

Single output - Relay

ET2001 J 230 05 F

Voltage
- 230 230V AC
- 110 110V AC
- 024 024 V AC
- SM 9-30V DC / 7-24V AC

Sensor Type
- J Thermocouple

Contact Current Selection
- 05 5A contact output
- 08 8A contact output
- 16 16A contact output

Units
- C Centigrade
- F Fahrenheit

Two output - Relay & SSR Drive

ET2011 RT 230 P F

Voltage
- 230 230 V AC
- 110 110 V AC
- 024 024 V AC
- SM 9-30V DC / 7-24V AC

Sensor Type
- RT PT100/RTD
- T Thermocouple

Relay
- (blank) 8A relay
- P 16A relay

Units
- (blank) Centigrade
- F Fahrenheit

The ET2411 and ET2412 are specifically designed for use with NTC sensors. They are easy to configure, have a large clear display for good visibility and a compact design that is fast to install.

The EDT defrost thermostats have additional features to ensure optimum control and performance of a refrigeration system such as compressor protection, defrost control, real-time clock, communications and fast CAL-Key memory programming.

ET2411 & ET2412 Digital Thermostats

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- NTC Sensor input -60 to 150°C
- Up to 2 outputs
- High current relay output available
- Heating or cooling On/Off control strategy
- CE

EDT2411, EDT2412 & EDT2423 Digital Thermostats

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- Up to Two NTC Sensor input -60 to 150°C
- Up to 3 outputs
- High current relay output available
- RS485 Modbus communications
- Compressor, defrost and fan control
- Real-time clock option
- CAL-key configuration
- CE

ET2411 & ET2412

Voltage
230 230V AC
110 110V AC
024 24V AC/DC
012 12V AC/DC

ET2411 | 230 | 05 | F

11 1 x Relay
12 2 x Relay

Relay (1)
05 5A output
08 8A output
16 16A output

Units (1)
(blank) Centigrade
F Fahrenheit

EDT2411, EDT2412 & EDT2423

Voltage
230 230V AC
110 110V AC
12 12V AC/DC
24 24V AC/DC
SM 9-30Vdc / 7-24Vac

Options
(blank) Not fitted
RTC Real-time clock (2)

EDT2411 | 230 | R | RTC | RS | F

11 1 x NTC sensor, 1 x relay
12 1 x NTC sensor, 2 x relay
23 2 x NTC sensor, 3 x relay

Relay
R 8A output
P 20A output (3)

Modbus Selection
(blank) Not fitted
RS Modbus RTU

Units
(blank) Centigrade
F Fahrenheit

(1) These options are only available or ET2411
(2) Only available with 8A relay devices
(3) Not on EDT2423

ETM2432 Digital Timer

In the same style as the thermostat range, a digital timer is available for associated monitoring and time-based control.

The ETM2432 is fully adjustable with nine timer modes and designed for easy integration within a control installation to fit the user's needs.

Benefits and features

- 35 x 77 mm format, 71mm depth (29 x 71 mm cutout)
- External start, reset and hold digital inputs
- Dual contact timed output
- HH:MM or MM:SS
- Scale 0:01 to 99:59 minutes
  0:01 to 99:59 hours
- Adjustable increasing and decreasing steps
- Time remaining displayed
- Start/stop control from front panel
- Upper and lower adjustable timer limits
- CE

Voltage

230 230V AC
110 110V AC
24 24V AC/DC
12 12V AC/DC
SM 9-30V DC / 7-24V AC

ETM2432 **230**

Paperless Recorders

DataVU 6 Paperless Recorder

The DataVU 6 paperless recorder features a resistive touchscreen and an intuitive, icon-based operation and visualisation concept that makes it very easy to use.
DataVU 6 supports up to 6 internal channels and up to 24 total by adding external I/O.

Benefits and features

- 144 x 144 x 119 mm (H x W x D)
- TFT display with touch operation
- Up to 6 internal analog inputs
- Up to 2 analog outputs
- RS485 Modbus and Modbus TCP communications
- Modbus master function
- 18 external analog and digital channels
- 1 GByte internal data memory
- Horizontal and vertical line graph
- CE, UL and cUL

Software packages
0 Unit without software package
1 Setup program, USB cable, PC evaluation software

In- / Outputs Slot 1
0 None
1 3 analog inputs, 6 digital inputs and 1 analog output

In- / Outputs Slot 3
0 None
1 12 digital inputs / outputs (individual configurable)

Option
0 None
1 Math and logic module

VU6 | 1 | 0 | 1 | 1 | 1 | 0 | 0

Setup
0 Factory defaults
1 Customer specific settings

In- / Outputs Slot 2
0 None
1 3 analog inputs, 6 digital inputs and 1 analog output

Power supply options
0 110 - 240V AC, 48-63 Hz
1 20 - 30V AC/DC, 48-63 Hz

DataVU 7 Advanced Paperless Recorder

The DataVU 7 paperless recorder features a high contrast TFT display and an intuitive dial operation. The unit supports up to 18 internal channels and up to 72 total by adding external I/O. The evaluation software toolkit allows easy creation of reports and simplifies configuration.

Benefits and features

- 144 x 144 x 200 mm (H x W x D)
- Large TFT color display (5.7")
- Up to 18 internal analog inputs
- Up to 7 relay outputs and/or up to 24 digital I/O
- RS485 Modbus, Profibus and Modbus TCP communications
- Modbus master function
- RS232 barcode interface
- Password securty protection
- Supports 54 external analog channels
- Horizontal and vertical line graph
- CE, UL and cUL

VU7 3 0 3 1 0 0

In- / Outputs Slot 1
- 0 None
- 3 3 Universal inputs and 8 DI/DO
- 6 6 Universal inputs

In- / Outputs Slot 2
- 0 None
- 3 3 Universal inputs and 8 DI/DO
- 6 6 Universal inputs

In- / Outputs Slot 3
- 0 None
- 3 3 Universal inputs and 8 DI/DO
- 6 6 Universal inputs
- R 6 Relay outputs

Power supply options
- 0 110 - 240V AC, 48-63 Hz
- 1 20 - 30V AC/DC, 48-63 Hz

Option 1
- 0 Lithium battery for memory
- 1 Lithium battery for memory + math function module
- 2 Lithium battery for memory + Profibus DP interface
- 3 Lithium battery for memory + math function module + Profibus DP interface
- 4 Capacitor for memory buffering (1)
- 5 Capacitor for memory buffering + math function module
- 6 Capacitor for memory buffering + Profibus DP interface
- 7 Capacitor for memory + math function module + Profibus DP interface (1)

Option 2
- 0 None
- 1 Stainless steel front

Pressure Transmitters

P30-2 Pressure Transmitter

Industrial pressure transmitters for safe measurement and monitoring of many applications including gases, vapors and liquids. Designed to withstand harsh environments in the process industry.

P30-2 is suitable for applications up to 40 bar gauge pressure.

Benefits and features

- Premium pressure transmitter for gauge pressure measurement with 3 years warranty
- High repeatability and long-term stability
- High overload resistance
- Measuring ranges up to 40 bar (600psi)
- Customer specific measuring ranges available
- Flush mounted or manometer connection
- Housing and connection made from 316L

Process connection (Internal diaphragm)

1 G ½" A, EN 837, ISO 228
2 G ¼" A, EN 837, ISO 228
3 M20 x 1,5, EN 837, DIN 13
4 G ½" A, with M5 inner thread
5 G ½" A, with mechanical damping

Process connection (Flush mounting)

7 G ½" A, DIN3852, ISO 228
8 G ½" A with O-Ring

Output signal

1 4..20mA, two-wire connection
2 0..10V, three-wire connection

Configuration

03	0-400 mbar	09	0-6 bar
04	0-600 mbar	10	0-10 bar
05	0-1.0 bar	11	0-16 bar
06	0-1.6 bar	12	0-25 bar
07	0-2.5 bar	13	0-40 bar
08	0-4 bar	99	Special Ranges (from -1bar)

P30 - 2 1 1 - 2 0 03 0 - 00 1

Electrical connection

1 M12 Connector
2 Valve connector ISO4400 M16
3 Valve connector ISO4400 NPT1/2

Test and Calibration

0 Manufacturing test report
1 Calibration certificate

Output filter (electronic damping)

0	No Filter	3	300ms
1	100ms	4	400ms
2	200ms	5	500ms

P40-2 Pressure Transmitter

Industrial pressure transmitters for safe measurement and monitoring of many applications including gases, vapors and liquids. Designed to withstand harsh environments in the process industry.

P40-2 is suitable for applications up to 400 bar gauge and absolute pressure with excellent accuracy and repeatability.

Benefits and features

- Premium pressure transmitter for gauge and absolute pressure measurement with 3 years warranty
- High repeatability and long-term stability
- High overload resistance
- Measuring ranges up to 400 bar (6000psi)
- Customer specific measuring ranges available
- Flush mounted or manometer connection
- Housing and connection made from 316L

Process connection (Internal diaphragm)

1 G ½" A, EN 837, ISO 228
2 G ¼" A, EN 837, ISO 228
3 M20 x 1,5, EN 837, DIN 13
4 G ½" A, with M5 inner thread
5 G ½" A, with mechanical damping

Process connection (Flush mounting)

7 G ½" A, DIN3852, ISO 228
8 G ½" A with O-Ring

Measuring

0 Gauge pressure
1 Absolute pressure

Special Version

0 Standard
1 Free of grease and oil

Configuration

02	0-250 mbar	12	0-25 bar
03	0-400 mbar	13	0-40 bar
04	0-600 mbar	14	0-60 bar
05	0-1.0 bar	15	0-100 bar
06	0-1.6 bar	16	0-160 bar
07	0-2.5 bar	17	0-250 bar
08	0-4 bar	18	0-320 bar
09	0-6 bar	19	0-400 bar
10	0-10 bar	99	Special Ranges (from -1bar)
11	0-16 bar		

P40 - 2 1 1 - 2 0 03 0 - 00 1

Electrical connection (4..20mA)

1 M12 connector
2 Valve connector ISO4400 M16
3 Valve connector ISO4400 NPT1/2
4 Cable outlet with 5m cable
5 Cable outlet with 10m cable
6 Cable outlet with 25m cable

Test and Calibration

0 Manufacturing test report
1 Calibration certificate

Output filter (electronic damping)

0	No Filter	3	300ms
1	100ms	4	400ms
2	200ms	5	500ms

For a full list of available modules please refer to the Pressure Transmitters brochure or visit **www.west-cs.com** to get in contact.

Contact

USA

Email: inquiries@west-cs.com
Website: www.west-cs.com
Telephone: +1 800 866 6659
Address: 1675 Delany Road
Gurnee
IL 60031-1282
USA

Brazil

Email: atendimento@ftvindtech.com
Website: www.west-cs.com.br
Telephone: 55 11 3616-0195 / 55 11 3616-0159

China

Email: china@west-cs.cn
Website: www.west-cs.cn
Telephone: +86 400 666 1802

France

Email: fr@west-cs.com
Website: www.west-cs.fr
Telephone: +33 171 84 1732

Germany

Email: de@west-cs.com
Website: www.west-cs.de
Telephone: +49 561 505 1307

UK

Email: enquiries@west-cs.com
Website: www.west-cs.co.uk
Telephone: +44 (0)1273 606271

West Control Solutions is part of the Fortive Corporation.
Specifications are subject to change without notice, as a result of our continual development and improvement, E&OE.

BR-PC-2-US-1808