

Каталог продукции



CAL Temperature Controllers

Auto-tuning P.I.D. Controllers with RS232/485 Communication, Charting and Logging Software

The CAL range of temperature controllers are designed to be easy to use, low cost and reliable in the most demanding applications, including plastics, packaging, drying and laboratory equipment.

Integrated auto-tune makes P.I.D. control simple and efficient, while the unique dAC function minimises overshoot problems associated with conventional P.I.D. Controllers.



Model 9400
48 x 48 mm
(1/16TH DIN)



Model 9300
48 x 48 mm
(1/16TH DIN)



Model 3300
48 x 24 mm
(1/32ND DIN)

Functionality:

- Easy-to-use auto-tune program
- Simple menu-driven programming
- Full P.I.D. operation
- Single ramp/soak (dwell) program
- Heat/cool operation
- IP66 protection
- CE compliant

Inputs and Outputs:

- Thermocouple and PT100 (2 wire)
- Two outputs: SSR driver and/or Relay
- 5 alarm modes, full scale (high or low), deviation (high or low) & band
- RS232 or RS485 MODBUS communications RTU (retrofitable)

CAL 9500P - Programmable Profiling Temperature and Process Controller



The CAL9500P is a uniquely versatile and affordable programmable controller for temperature and process control applications. It is designed to offer the optimum functionality in a 48mmx48mm (1/16th DIN) package.

The CAL9500P shares the same unique features as the 3300, 9300 and 9400 and also offers:

Programmer functionality

- Up to 31 programs (profiles)
- Up to 126 segments
- Event outputs via the 2nd and 3rd outputs
- Copy/Paste/Edit/Delete functions to simplify program building
- Call another program as a sub-program segment
- Up to 999 program loop cycles, or continuous loop cycling
- Hold back function, to ensure the next segment is not started until the last segment reaches the set-point
- 3 power fail recovery options, (Hold, Continue or Reset)

- Front panel interrogation of the program position
- Memory usage indication during programming

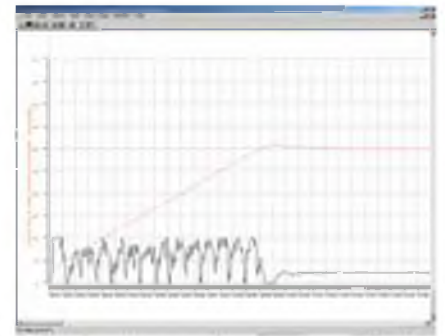
(note: program capacity is a memory function and different types of segments use more or less memory).

Inputs and Outputs:

- Input: Thermocouple PT100 (2 or 3 wire), 4-20mA, 0-5V or 0 to 10V
- 3 Outputs: Relay, SSD, 4-20 mA 0-5V and 0 to 10V

CALgrafix - Process Monitoring and Configuration Software

Cost-effective process monitoring and controller configuration software, providing even greater value to CAL's range of temperature controllers. With powerful functions including data logging and process data archiving, chart recorder, virtual instrument display and on-screen alarm and display, CALgrafix software is the ideal solution for control of critical data, for quality control, and health and safety and machine development and build.



All features integrate seamlessly within one single user interface, providing total configuration features for ultimate control and even cloning of instrument settings.

Advantages of using CALgrafix:

- Reduce installation time – quick and simple controller configuration
- Access to detailed process data via the charting and logging features
- Lower cost alternative to SCADA
- Simple set up, no programming skills required
- Reduce changeover time for different process recipes

Configuration:

- Parameter set-up of 33/93/9400 and 9500P controllers
- Click and drag graphical profile set-up for 9500P controllers
- Multiple programs and profiles can be saved and recalled for various applications
- Instrument setting cloning reduces set up time

CALgrafix Applications:

- Environmental and test chambers
 - Plastic injection and extrusion machines
 - Ovens, autoclaves, furnaces, and kilns
 - Scientific research and testing
 - Food processing equipment
- and your application**

Ordering information

3300, 9300 & 9400		Code
Model	48 x 24 mm	33
	48 x 48 mm	93
	48 x 48 mm dual display	94
Outputs (Reversible)	SSD / 2A relay	00
	2A relay / 1A relay	11
	SSd / SSd	22
Unused		00
Comms	None fitted	0
	RS232 fitted	2
	RS485	4
Supply	100-240V AC	0
	12-24V AC/DC*	3
Unused		00

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

Ordering example 1

Model 3300 48x24mm, SSd / relay, RS485, 12-24V

33	00	00	4	3	00
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Ordering example 2

Model 9500P ssd / relay / relay outputs 4-20mA input, RS485 fitted

95	00	1	B	4	00
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9500P		Code
Model	48 x 48 mm	95
Outputs 1 & 2 (Reversible)	SSd / relay	00
	relay / relay	11
	SSd / SSd	22
	4-20mA / relay	B1
	4-20mA / ssd	B2
	0-5V / relay	C1
	0-5V / ssd	C2
	0-10V / relay	D1
0-10V / ssd	D2	
Output 3	Always relay	1
Programmer		P
Inputs	Sensor	A
	4-20mA	B
	0-5V	C
	0-10V	D
Communications	None fitted	0
	RS232 fitted	2
	RS485 fitted	4
Unused		00

Codes for additional software and hardware

CALgrafix	10	03	GB	0	0	0
Communications board RS232	3C	00	00	2	0	0
Communications board RS485	3C	00	00	4	0	0
RS232 to RS485 converter	3C	25	00	0	K	3

Input	
Thermocouple	9 types: Type B,E,J,K,L,N,R,S,T
Standards	IEC 584-1-1 : EN60584-1
CJC rejection	20:1 (0.05 ^o /°C) typical
External resistance	100Ω maximum
Resistance Temperature Detector – (RTD)	3300 / 9300 / 9400: PT100 2 wire, 9500P: PT100 2 or 3 wire
Standards	IEC751: EN60751 (100Ω 0°C/138.5Ω 100°C Pt)
Bulb current	0.2mA maximum
Linear process inputs	Analogue process inputs 0 to 50mV, +/- 0.1%. 9500P: 0-20mA, 4-20mA, +/- 0.1%. 0-5V, +/- 0.1%. 0-10V, +/- 0.1%
Applicable to all Thermocouple and RTD inputs (SM=sensor maximum)	
Calibration accuracy	±0.25%SM ±1°C
Sampling frequency	Input 10Hz, CJC 2 sec
Common mode rejection	Negligible effect up to 140dB, 240V, 50-60Hz
Series mode rejection	60dB, 50-60Hz
Temperature coefficient	3300 / 9300 / 9400: 150ppm/°C SM, 9500P: 50ppm/°C SM typical
Reference conditions	22°C ±2°C, rated voltage after 15 minutes settling times
Output devices	
SSd	SSd1 and SSd2: Solid state relay driver: To switch a remote SSR 6Vdc (nominal) 20mA non-isolated
Miniature power relay	Relay 1,2,3 Miniature power relay: Form A/SPST contacts (AgCdO): 2A/250Vac resistive load. 3300 / 9300 / 9400: Relay 1, 2 only
Linear outputs: 9500P only	Analogue output: 4-20mA 500Ω max +/- 0.1% full scale typical, 0-5Vdc 10mA (500Ω min) +/- 0.1% full scale typical, 0-10Vdc 10mA (1KΩ min) +/- 0.1% full scale typical
General	
Displays	Main (upper) display:, 4 digits high brightness green LED, 10mm high Lower display 9400 / 9500P: 4 digits high brightness orange LED, 9mm high
LED output indicators	Flashing SP1 square, green, SP2 round red
Keypad	3 full travel elastomeric buttons
Environmental	
Safety	UL 873, EN 61010, CSA 22.2 No. 1010.1-92
Humidity	Max 95% non-condensing
Altitude	Up to 2000m
Installation	Categories II and III
Pollution	Degree II
Protection	NEMA 4X, IP66
EMC emission	EN50081-1, FCC Rules 15 subpart J Class A
EMC immunity	EN50082-2
Ambient	0-50°C
Mouldings	Flame retardant polycarbonate
Dimensions	
Front fascia Models	9300 / 9400 / 9500P: 51.0 x 51.0mm (includes gasket). 3300: 51.0 x 28.5 (includes gasket)
Controller depth All models	106.7mm (with gasket fitted)
Fascia dimensions	9300 / 9400 / 9500P: 44.8 x 44.8mm, 3300: 44.8 x 22.0mm
Overall length	All models – 116.2mm
Weights	3300: 110g, 9300: 120g, 9400: 130g, 9500P: 180g (6.4oz)
Supply Voltage	100-240Vac, 50-60Hz +/- 10% maximum permitted fluctuation, 12V - 24V (AC/DC) +/-20% 4.5 VA Polarity not required
Digital range: 9500P only	199 to 9999. Hi-res mode -199.9 to 999.9
Programmer: 9500P only	
Segments	Total of 126 per program
Programs	Maximum of 31 programs
Program memory	351 Bytes
Approvals	CE, UL, cUL, FM (3545)

По вопросам продаж и поддержки обращайтесь:
Астана +7(7172)727-132, Волгоград (844)278-03-48, Воронеж (473)204-51-73,
Екатеринбург (343)384-55-89, Казань (843)206-01-48, Краснодар (861)203-40-90,
Красноярск (391)204-63-61, Москва (495)268-04-70, Нижний Новгород (831)429-08-12,
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Санкт-Петербург (812)309-46-40, Саратов (845)249-38-78, Уфа (347)229-48-12
Единый адрес: wts@nt-rt.ru
www.west.nt-rt.ru

The Temperature Control Range for Plastics & Extrusion

Discrete DIN Controller | PlastX

The new PlastX range offers a cost-effective, fixed build solution for precision temperature control for extruders.

The PlastX instruments provide a simplified user menu which includes pre-populated setup fields with default parameters for plastic applications. This, together with the removal of unnecessary options ensures configuration is straightforward and fast to implement for users.

The new plastics specific range provides options for Heat and Heat/Cool control and includes a function for setpoint ramping, which is particularly useful in extrusion applications to protect from heater burn out.

The versatile instruments can also be used simply as process indicators reducing the need to stock multiple products for extrusion applications, thus streamlining the product portfolio and reducing inventory.



At a Glance:

- Universal input
- Multiple output configurations
- LEDs indicate low alarm, band alarm, and auto-tune
- On/off button for zones not in use
- Suitable for twin and single screw extruders
- Selectable controller or indicator modes
- Heat only or Heat/Cool control modes
- Setpoint Ramping function
- Available options: RS485, SSR, Triac, relay
- Available in 1/8 DIN and 1/16 DIN sizes

A One Page Quick Start Guide is available in English and Spanish.



The Temperature Control Range for Plastics & Extrusion



Panel Mounted Indicator | West 8010+

Every extruder requires an indicator to display the melt temperature.

The 8010+ from West Control Solutions is a digital panel mounted temperature indicator, offering a high contrast, high visibility display. The process indicator provides a user selectable dual color display option with fixed red or green displays or a green to red color change when an alarm condition occurs.

Importantly the 8010+ is a landscape 1/8 DIN instrument, meaning that operators will not misinterpret the display as a temperature zone.



At a Glance:

- High contrast, high visibility display
- Up to 5 outputs
- Up to 4 alarm outputs (latching or non-latching)
- Retransmission output
- Plug-in output modules for SSR Driver, Triac, Relay and Linear Outputs – easily field changeable
- PC configurator with easy to use “wizard” suits both novice and experienced users
- Jumperless configuration
- RS 485 communication option

Modular, Multi Loop Controller | KS Vario

The KS Vario multi loop control system enables 4 to 30 temperature zones to be controlled independently.

KS Vario can be used with any programmable logic controller (PLC) to provide superior temperature control at an affordable cost. The basic version consists of a controller module and a field bus coupler. These two components already provide a fully operational control unit with 4, 6 or 8 loops. Simply by adding the required number of individual I/O modules, the modular system is expandable up to 30 control loops with minimum extra cost.

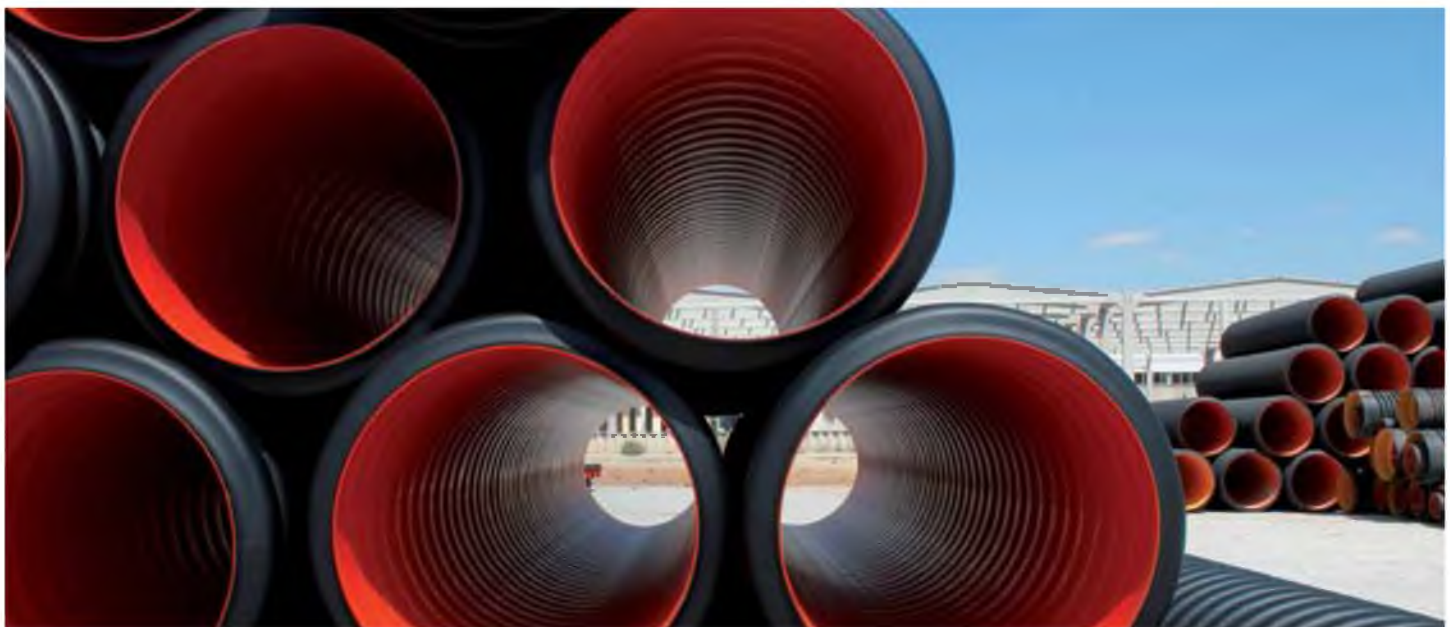
The standard KS Vario includes a controlled start-up function specifically for plastics processing machines.

Required components including; bus coupler, control unit and an arbitrary number of I/O modules in



different sizes (2, 4, 8, or 16 channels), are simply plugged together whereby all inter-connections are made automatically.

The modular approach makes the KS Vario controller unusually cost-effective and allows it to be adapted precisely to individual tasks. Due to bus coupler modules for Ethernet, ProfiNet, Profibus DP, CANopen, DeviceNet, and Modbus - the system is open for all major industrial field buses.



Touchscreen Multi Zone Control | KS Vario BT

The sophisticated KS Vario BT provides remote, standalone operation of the KS Vario controller system through a high contrast colour touchscreen HMI making the KS Vario BT a cost effective and panel space saving control solution.

The multi-channel system provides a comprehensive range of functions for up to 30 control zones as well as offering the possibility to operate several single loop controllers without the need of a superordinate PLC.

At a Glance:

- Compact operating terminal with 3,5", 5,7" or 12,1" color display
- Graphic touchscreen operation
- Simple access for 4..30 control loops
- Overall surveys
- Configuration level
- Alarm processing
- Online trend display
- 3-level password protection
- Language selection
- Recipe management
- Direct connection of the KS Vario via RS 485 or RS232 Interface
- Ethernet interface



Thermostats

The CAL thermostat range is a complete family of small format devices for basic heating or cooling applications and also includes indicators and timers for associated monitoring and control.

The units are easy to configure and use, have a large clear display with good visibility and a compact design that is fast to install.

The EDT defrost models have many 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 programming.

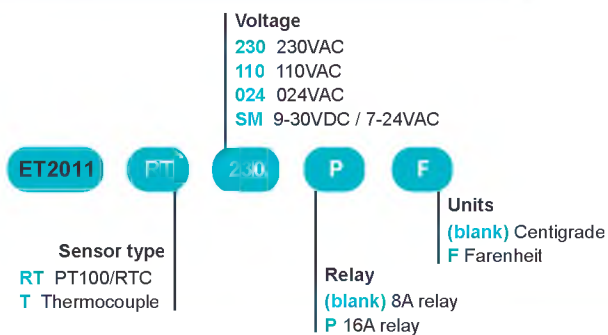
Digital Thermostats

- Heating or cooling applications
- Thermocouple or PT100 inputs
- 2 outputs for control and alarms
- 35 x 77mm format (29 x 71mm cutout)



ET2011

Input type	Thermocouple (J, K, T, S, R) or PT100		
Temperature range	PT100	-99.9 to 300.0°C	-99.9 to 543.0°F
	PT100	-200 to 600°C	-328 to 1112°F
	J T/C	0 to 600°C	32 to 1112°F
	K T/C	0 to 1300°C	32 to 2372°F
	T T/C	0 to 400°C	32 to 752°F
	S & R T/C	0 to 1700°C	32 to 3092°F
Control type	On/Off, PID		
Control strategy	Heat or cool control		
Number of relay outputs (8A)	1		
Number of SSR outputs	1		

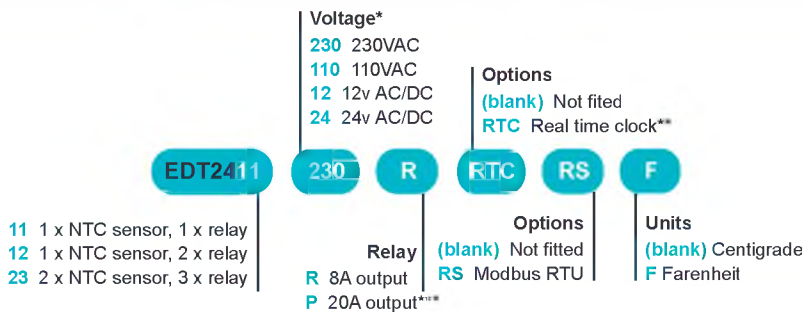


Defrost Thermostats

- Compressor, defrost and fan control
- Up to two NTC inputs for main and defrost temperature measurement
- Manual, timed and evaporator temperature defrost modes supported
- 35 x 77mm format (29 x 71mm cutout)
- CAL-Key for fast configuration
- Real-time clock option
- RS485 communications option



	EDT2411	EDT2412	EDT2423
Input type and number	NTC x 1	NTC x 1	NTC x 2
Temperature range	-60 to +150°C -76 to +302°F	-60 to +150°C -76 to +302°F	-60 to +150°C -76 to +302°F
Defrost function	Manual (key or DI)/ auto timed	Manual (key or DI)/auto timed	Manual (key or DI)/ timed/ evaporator temp
Number of relay outputs (8A)	1	2	3
High current relay option - compressor output (20A)	•	•	•
Defrost output		•	•
Fan output			•
Defrost sensor input			•
CAL-key flash memory programming	•	•	•
Real time clock option	•	•	•
RS485 Modbus communications option	•	•	•



* 9-30VDC, 7-24VAC version is also available as an extra cost option
 ** only available with 8A relay devices
 *** not on EDT2423

NTC

Description

NTC-APS--1,5S

Air probe, maximum 150 °C 302°F,
stainless steel shell, 1,5m silicone cable

NTC-LPS--1,5S

Liquid probe, maximum 150 °C 302°F,
stainless steel shell, 1,5m silicone cable

NTC-APP--1,5P

Air probe, maximum 80 °C 176°F,
plastic shell, 1,5m PVC cable

NTC-APT--1,5T

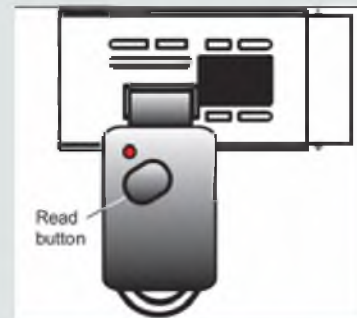
Air probe, maximum 105 °C 221°F,
thermoplastic shell, 1,5m thermoplastic cable



CAL Key

Save time programming EDT thermostats with **CAL-Key**.

- Upload configuration to key for cloning settings to additional devices
- Powered or unpowered configuration, key has battery



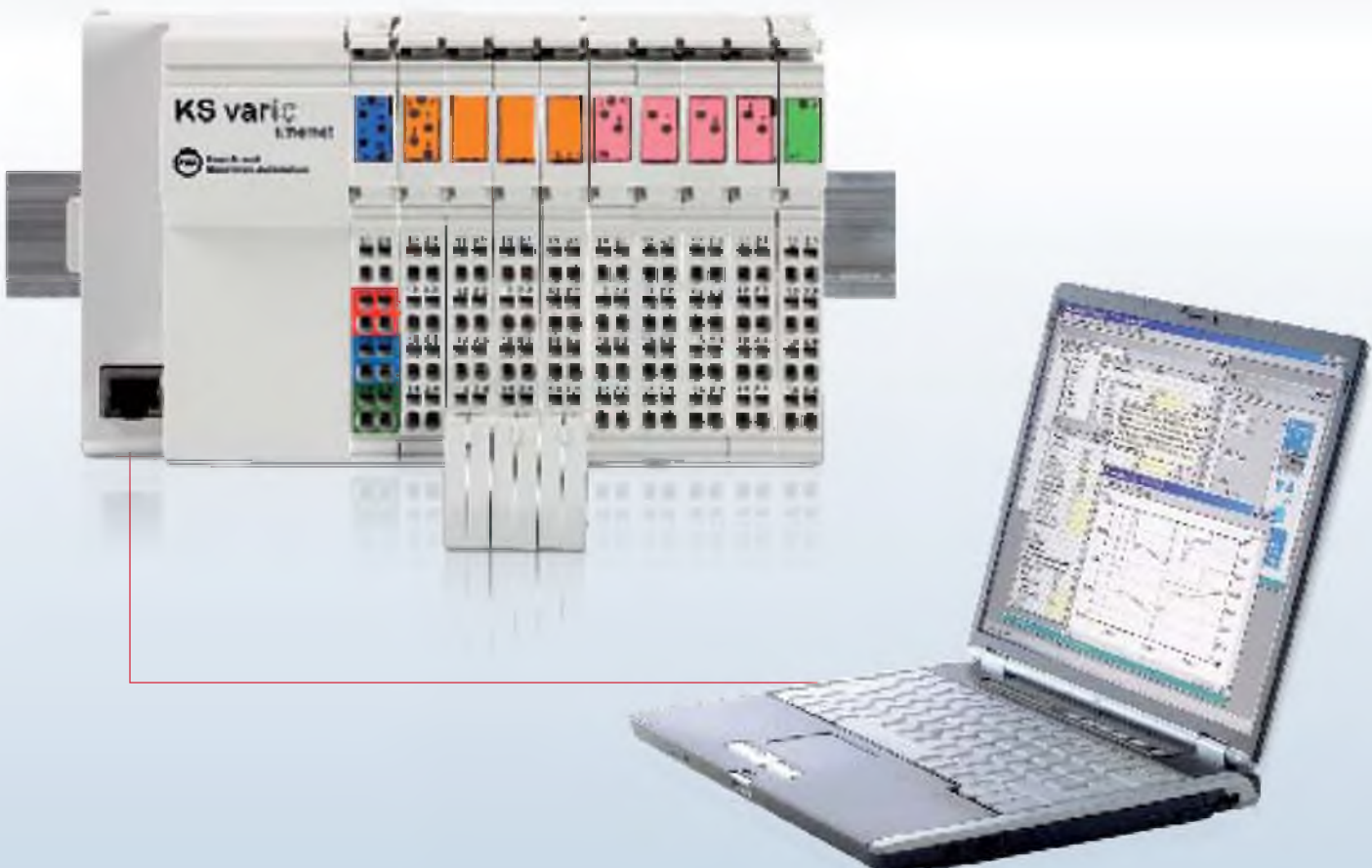
Modular, intelligent, open

The modular KS vario multiloop controller system has been developed specifically for temperature treatment processes, whereby the basic version consists of a controller module and a field bus coupler. These two components already provide a fully operational control unit with 4, 6 or 8 loops. Simply by adding the required number of individual I/O modules, the system is expandable up to 30 control loops with minimum extra cost. Hereby, no more I/O modules are required than those needed for the actual number of inputs & outputs. Moreover, the KS vario can also be expanded with standard I/Os, which are then made available to the superordinate system (PLC/SCADA).

The individual modules of a KS vario system are simply plugged together without the need for tools – all interconnections are made automatically, and power is supplied via the bus coupler. The field bus coupler with integral power supply represents the heart of the system, and links the multiloop controller to all established field bus systems. Apart from ProfiNet and innovative Ethernet topologies, the coupler also supports classical field buses such as Profibus-DP, CANopen, DeviceNet, and Modbus.

Application areas

- Extruder automation
- Hot runners
- Mold heating
- Textile machines
- Packaging machines
- Semiconductor production
- Furnaces
- Driers
- Climatic chambers
- Heat treatment
- Burner & boiler control
- Medical technology
- Sterilizers





Additional I/O modules are simply clipped into the system



Plug-in connections for fast module replacement



Signal ID marking and individual inscriptions



Galvanic isolation

The system at a glance

Control functions

All conventional control modes including master/slave and valve motor control are selectable per channel. Two self-tuning options are available for determining the best control parameters: during start-up or at setpoint. Individual sampling rates starting at 100 ms are adjustable for each channel.

Controller modules

- 4, 6 or 8 analog inputs
- Thermocouples or resistive sensors
- Up to 8 outputs, 24 VDC, 70 mA
- Integrated heating current monitor
- Expandable up to 30 control zones

Additional functions

Several special functions such as controlled start-up for plastics processing machines are standard features of the basic version. Comprehensive heating current monitoring functions with correction for mains voltage variations (per phase), and the direct connection of strain gauge pressure sensors are just two of many other features.

BlueControl® Engineering Tool

BlueControl® is a powerful engineering tool for controller and system configuration. It combines clear operating functions with visualization and monitoring. Moreover, the tool provides a simulation of the entire control loop with selectable process responses.

KS vario: The system components

COUPLERS



- KS VARIO BK PN**
- ProfiNet bus coupler
 - 2nd Ethernet port
 - ProfiNet real-time



- KS VARIO BK IP**
- Ethernet IP bus coupler
 - 10/100 Base T
 - IP protocol/Rockwell



- KS VARIO BK ETH**
- Ethernet TCP/IP bus coupler
 - 10/100 Base T
 - Modbus TCP, DDI, Boot P



- KS VARIO BK DP/V1**
- Profibus DP/V1bus coupler
 - Up to 12 Mbits/s
 - DP/V1 Class 1 and 2



- KS VARIO BK CAN**
- CANopen bus coupler
 - Up to 1 Mbit/s
 - Up to 32 PDOs



- KS VARIO BK DN**
- DeviceNet bus coupler
 - Up to 500 kbits/s
 - Polling, change of state



- KS VARIO BK MOD**
- Modbus bus coupler
 - Modbus RTU

INPUT MODULES



- VARIO DI 16/24**
- Digital input module
 - 16 inputs: 24 VDC



- VARIO DI 8/24**
- Digital input module
 - 8 inputs: 24 VDC



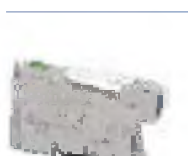
- VARIO DI 4/24**
- Digital input module
 - 4 inputs: 24 VDC



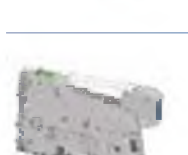
- VARIO DI 2/24**
- Digital input module
 - 2 inputs: 24 VDC



- VARIO AI 8/SF**
- Analog input module
 - 8 input, 0...20 mA, 4...20 mA, ±20 mA, 4...40 mA, ±40 mA, 0...5 V, ±5 V, 0...10 V, ±10 V, 0...25 V, ±25 V, 0...50 V



- VARIO AI 2/SF**
- Analog input module
 - 2 input, 0...20 mA, 4...20 mA, ±20 mA, 0...10 V, ±10 V



- VARIO RTD 2**
- Analog input module
 - 2 inputs for resistive sensors
 - Pt 100/Pt 1000



- VARIO UTH 2**
- Analog input module
 - 2 inputs for thermocouples

OUTPUT MODULES



- VARIO DO 16/24**
- Digital output module
 - 16 outputs: 24 VDC, 500 mA



- VARIO DO 8/24**
- Digital output module
 - 8 outputs: 24 VDC, 500 mA



- VARIO DO 4/24**
- Digital output module
 - 4 outputs: 24 VDC, 500 mA



- VARIO DO 2/24**
- Digital output module
 - 2 outputs: 24 VDC, 500 mA



- VARIO DO 4/230**
- Relay output module
 - 4 Changeover contacts, gold-plated
 - 5...253 VAC, 3 A



- VARIO DO 1/230**
- Relay output module
 - 1 Changeover contact, gold-plated
 - 5...253 VAC, 3 A



- VARIO AO 2/U/BP**
- Analog output module
 - 2 outputs: 0...10 V, ± 10 V



- VARIO AO 1/SF**
- Analog output module
 - 1 output: 0...20 mA, 4...20 mA, 0...10 V

I/O MODULES



- VARIO RTD 6 - DO 6**
- Combined I/O module
 - 6 inputs for resistive sensors
 - 6 outputs: 24 VDC, 70 mA
 - 1 heating current input



- VARIO UTH 8 - DO 8**
- Combined I/O module
 - 8 inputs for thermocouples
 - 8 outputs: 24 VDC, 70 mA
 - 1 heating current input



- VARIO UTH 4 - DO 8**
- Combined I/O module
 - 4 inputs for thermocouples
 - 8 outputs: 24 VDC, 70 mA
 - 1 heating current input

GENERAL-PURPOSE MODULES



- VARIO RM BK**
- Coupler module for remote I/Os
 - For all I/O modules



- VARIO RM TX**
- Branch module for remote bus
 - Max. bus length: 400 m



- VARIO CO 2/U**
- Supply module for sensors
 - 2 outputs: 10 V constant
 - 2 x 40 mA (or 1 x 80 mA)



- VARIO PWR IN/24**
- Power supply module
 - Segmentation

Performance features in detail

Comprehensive communication options

Bus couplers connect the I/O systems to all established field bus systems: ProfiNet, Ethernet IP, Ethernet TCP/IP, Profibus, CANopen, DeviceNet, Modbus.

Demand-oriented expansion

Simply by plugging additional I/O modules into the system, a finely graduated expansion up to 30 control loops is possible.

Automatic inter-connections

The necessary modules of a KS vario system are simply plugged together without the need for tools. All peripheral and data signals, as well as the supply voltages are connected automatically. The external 24 VDC system supply must only be connected to the bus coupler at one point.

Fast module replacement

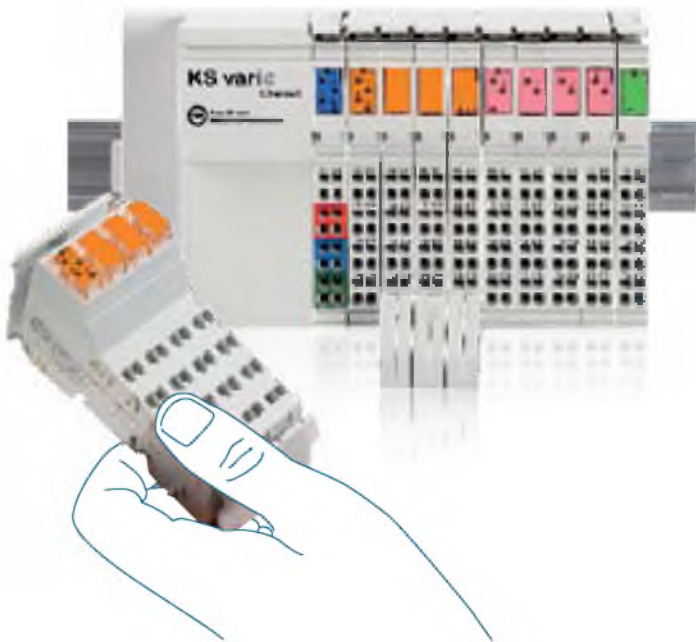
Thanks to the plug-in spring clamp connectors for the I/O wiring, quick and simple module replacement is ensured.

Galvanic isolation

Each segment is energized by means of special isolated power supply terminals, which automatically isolates them from the adjacent segments.

Clear identification

KS vario modules can be fitted with ‚Zack‘ numbering markers to identify every terminal. It is also possible to label each channel in plain text.



Size and dimensions



SR0 H 97 x W 36 x D 32 - 0,12kg.



SR1 H 97 x W 36 x D 92 - 0,29kg.



SR2 H 121 x W 36 x D 87 - 0,27kg.



SR3 H 121 x W 36 x D 125 - 0,44kg.



SR4 H 121 x W 72 x D 125 - 0,88kg.



SR5 H 121 x W 108 x D 125 - 1,32kg.



SR6 H 121 x W 36 x D 185 - 0,61kg.



SR7 H 121 x W 72 x D 185 - 1,22kg.



SR8 H 121 x W 108 x D 185 - 1,83kg.



SR9 H 121 x W 72 x D 185 - 1,15kg.



SR10 H 121 x W 108 x D 185 - 1,76kg.



SR11 H 121 x W 144 x D 185 - 2,4kg.



SR12 H 269 x W 93 x D 170 - 3,4kg.



SR13 H 269 x W 186 x D 170 - 6,8kg.



SR14 H 269 x W 279 x D 170 - 10,2kg.



SR15 H 273 x W 93 x D 170 - 3,6kg.



SR16 H 273 x W 186 x D 170 - 7kg.



SR17 H 273 x W 279 x D 170 - 10,6kg.



S9 H 350 x W 116 x D 220 - 5,1kg



S10 H 350 x W 240 x D 230 - 11kg.



S11 H 440 x W 137x D 270 - 10,5kg.



S12 H 520 x W 137 x D 270 - 15kg.



S13 H 440 x W 262 x D 270 - 18kg.



S14 H 520 x W 262 x D 270 - 22,5kg.



S15 3PH H 520 x W 400 x D 270
43kg. (850A)



S16 2PH H 580 x W 400 x D 435
54kg. (1000A)

S17 2PH H 780 x W 400 x D 435
65kg. (1400A-1500A)



S18 1PH H 580 x W 263 x D 435
28kg. (1000A)

S19 1PH H 780 x W 263 x D 435
39kg. (1400A-1500A)

S20 1PH H 780 x W 263 x D 533
48kg. (2000A)

S21 1PH H 890 x W 263 x D 518
58kg. (2700A)



S22 3PH H 580 x W 525 x D 435 - 56kg. (1000A)

S23 2PH H 780 x W 525 x D 533 - 96kg. (1850A-2000A)

S24 2PH H 890 x W 525 x D 518 - 116kg. (2400A-2700A)

S25 3PH H 780 x W 525 x D 435 - 77 kg. (1500A)



S26 3PH H 790 x W 780 x D 533 - 144kg. (1850A-2000A)

S27 3PH H 790 x W 890 x D 518 - 174kg. (2400A-2700A)

Relay CL



SIZE SR9



SIZE SR9

Technical Specification

- Dimensions: See size at page 6-7 and dimensions at page 8-9
- Load type: Normal resistive, infrared long, short and medium waveform, Silicon Carbide and cold resistance
- Inputs: 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- Firing mode: Burst Firing, Single Cycle, Soft Start + Phase Angle, Delayed Triggering
- Operating temperature: 0 to 40° C without derating
- Control mode: V2, V Voltage, VxI Power and current I
- RS485 port. RTU Modbus Protocol
- Comply with EMC and cUL (Pending)
- Data sheet: More details on "Relay CL" bulletin

Option

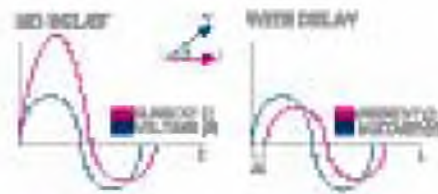
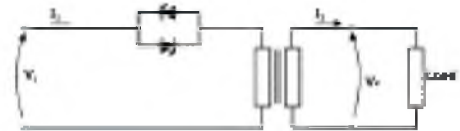
- Current Transformer + HB

Thyristor Unit connected with Transformers

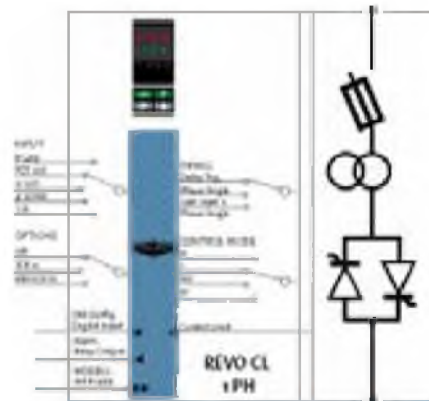
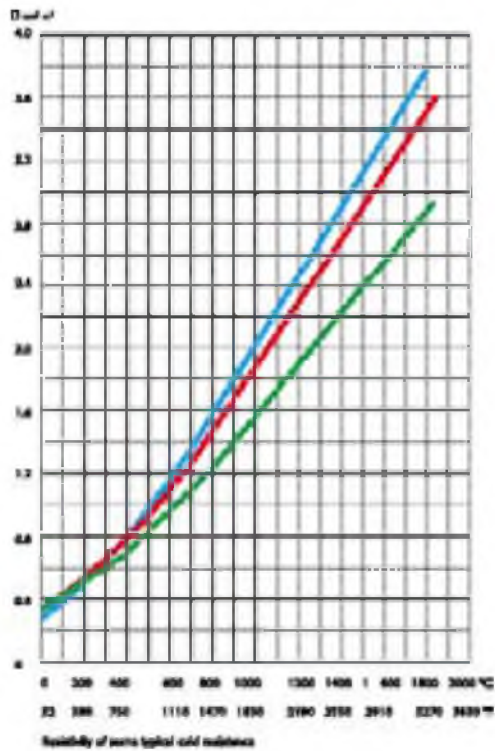
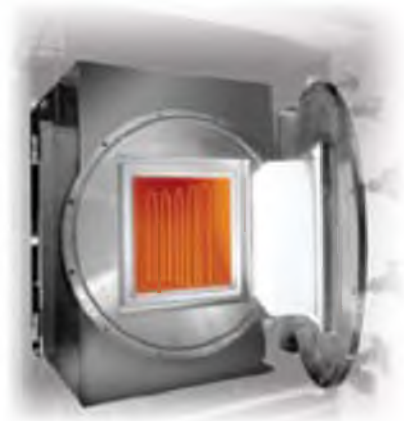
Relay CL has been specifically designed to drive transformers and has all the drive capability & techniques required, configurable from the front panel display. Close examination of the transformer application needs to be made as the typical inrush current, when switched on. This over-current will have the result of fuse or thyristor failure.

To avoid this peak current two techniques can be used:

- Phase angle firing with soft start and current limit. This type of firing can be used with all types of loads.
 - Normal resistance.
 - Cold resistance (Example: Kanthall Super elements)
 - Transformer coupled with normal or cold resistance.
- Burst firing using the Delay Triggering (DT) technique. To avoid magnetic circuit saturation, the thyristor unit will switch OFF when the load voltage is negative and switch ON again when positive. The unit also has an adjustable delay on voltage zero crossing. In this way it is possible to switch ON when current is zero.
- This Firing technique can only be used with normal resistance, where its resistive value remains constant with temperature variations.



The BIG advantage with Relay CL
Buy one unit and you remove all application risks, selecting Phase Angle or Delayed Triggering as required via frontal Key Pad.



Relay SSR

Relay S



Relay SSR and Relay S share the same electronics.

Relay SSR, available without the heat sink and designed for mounting on large custom-made heat sinks with water or air dissipated cooling. Suitable for hostile environments.

Relay S, is mounted on PMA heatsinks

Normally mounted inside the cabinet, two or three can be connected to give 2-3PH units suitable to drive 3 Phase Loads.

- Solid State Relay
- Zero Crossing Firing
- SSR or Analogue input
- Fuse and Fuse Holder
- Current Transformer

Relay SSR family

GENERAL FEATURES

Relay SSR SOLID STATE RELAY

This is the basic building block of the Relay Family, designed for modularity and configurability:

- Designed to replace contactors.
- Applicable for resistive loads and infrared lamps.
- Supply Voltage up to 480V or 600V AC.
- Three types available with different current values dependent on the heatsink used (see graph on right).
- Single phase formed by two thyristors in anti-parallel to provide a long life.
- Zero Crossing Firing.
- Logic input signal SSR 4:30V DC.
- LED indication of ON status.
- Constant current drain, independent of supply voltage.
- Built in over voltage protection with snubber network.
- IP20 protection.
- Fixing with standard types used for Solid State Relay.
- Comply with CE and cUL specification.

Relay SSR + FUSE & FUSE HOLDER

The quick-blow fuse & fuse holder is now included inside the Relay module, providing the following options:

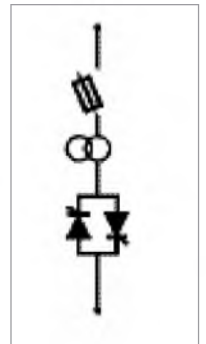
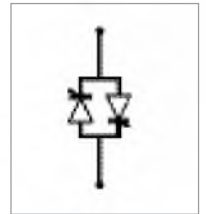
- Fuse & fuse holder 45A Max.
- Internal current transformer.
- Current transformer + HB alarm to diagnose partial or total load failure and short circuit on thyristors with automatic setting, relay alarm output and front LED indication.
- Analogue input 0-10V or 4-20mA.
- Front calibration command for HB alarm.
- Flat cable to connect a number of Relay units mounted side by side to reduce the wiring dramatically.

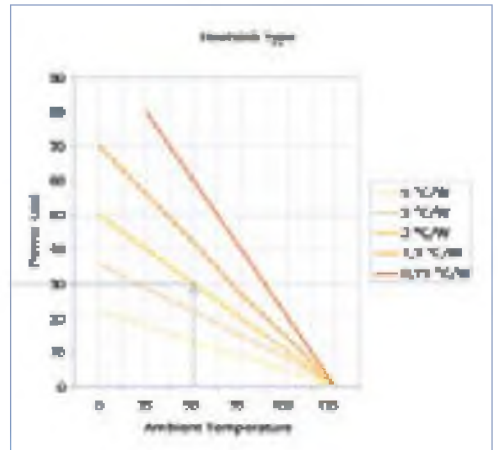
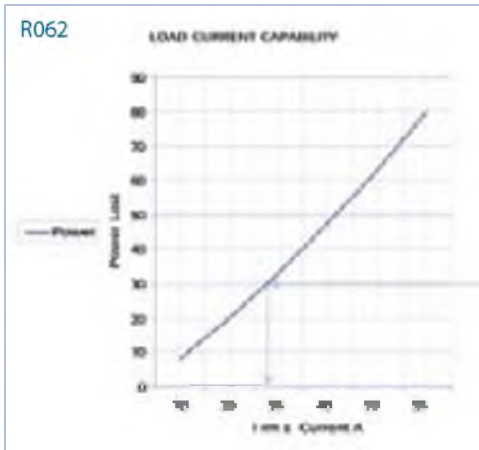
Machine makers use this Relay configuration and is normally mounted on large Heat sinks with external air or water-cooling.

Relay SUB ASSEMBLY

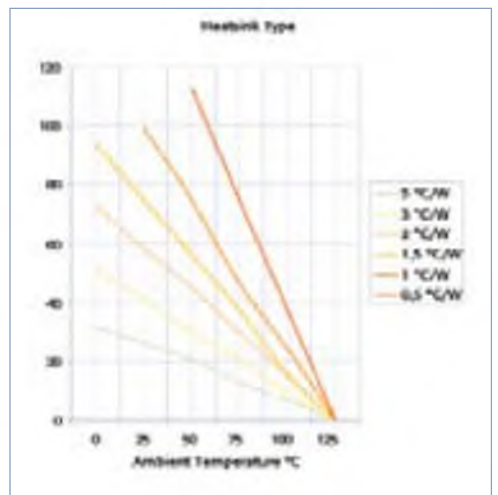
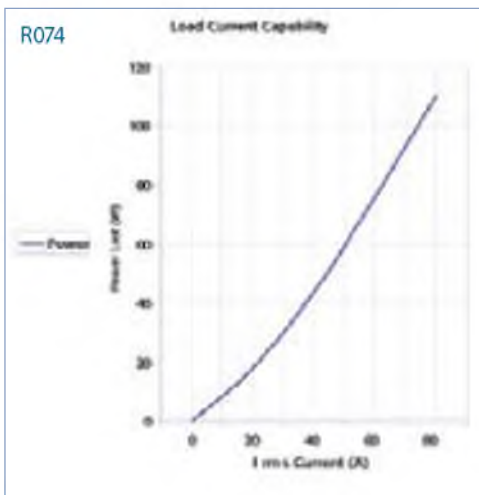
PMA also offers the sub assembly parts.

If for example you want to use a Relay SSR with a different heatsink than standard, this can be easily done but consideration must be made not to exceed the current of 45A. This is due to the high temperature created by the high power dissipation of the ultra-fast semiconductor fuse. If there is a need to go over 45A, the way to overcome the high power dissipation is to use an external ultra fast fuse & fuse holder but with a higher rating.

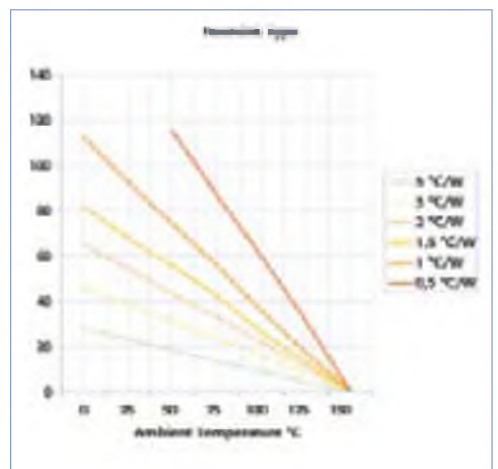
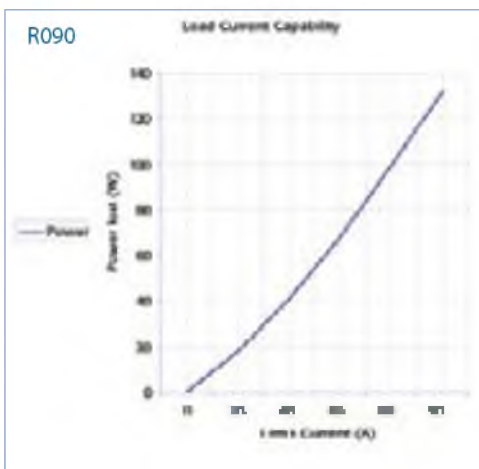




R062 MODULE Power Dissipation versus on state Current and ambient Temperature



R074 MODULE Power Dissipation versus on state Current and ambient Temperature



R090 MODULE Power Dissipation versus on state Current and ambient Temperature

Relay S

GENERAL FEATURES

Relay S is a family of thyristor units

suitable to drive single and three phase loads

- Suitable for resistive and infrared loads.
- Supply voltage up to 480V or 600V AC.
- From 30 to 210A.
- Fully isolated from the power.
- Each phase formed by two thyristors in anti-parallel to give long life .
- Zero Crossing Firing.
- Logic input signal SSR 4-30V DC.
- Constant current drain, independent of supply voltage.
- Analogue input 0-10V or 4-20mA, is available as an option.
- Side by side mounting.
- Special design for heatsink with high dissipation value.
- DIN base plate and bulk head for panel mounting.
- IP20 protection.
- Comply with CE and cUL specification.



Relay S 1-2-3PH · 30-35-40A

- Fully isolated from the power.
- Single phase formed by two thyristors in anti-parallel to give long life.
- Zero Crossing Firing.
- Logic input signal SSR 4-30V DC.
- Constant current drain, independent of supply voltage.
- Side by side mounting.
- Special design for heatsink with high dissipation value.
- DIN base plate for panel mounting.



Relay S 1-2-3 PH + FUSE&FUSE HOLDER 30-35-40-60-90A

The fuse & fuse holder can be mounted on Relay S shown above. If internal fuse holder has been selected these additional features are available:

- Internal current transformer.
- Current transformer + HB alarm to diagnose partial or total load failure with automatic setting, relay alarm output and front LED indication. Front calibration command for HB alarm.
- Analogue input 0-10V or 4-20mA, is available as an option.
- Flat cable option to connect a number of Relay units with HB alarm or auxiliary power supply.



Relay S + INTEGRATED FUSES 120-150-180-210A

The fuse is integrated inside the unit and these additional features are available:

- Internal current transformer.
- Current transformer + HB alarm to diagnose partial or total load failure with automatic setting, relay alarm output and front LED indication. Front calibration command for HB alarm.
- Analogue input 0-10V or 4-20mA, is available as an option.
- Flat cable option to connect a number of Relay units with HB alarm or auxiliary power supply.



30-35-40A
1PH



30-35-40A
2PH



30-35-40A
3PH



30-35-40A
1PH



30-35-40A
2PH



30-35-40A
3PH



60-90A
1PH



60-90A
2PH



60-90A
3PH



120-150-180-210A
1PH



120-150-180-210A
2PH



120-150-180-210A
3PH

Relay M



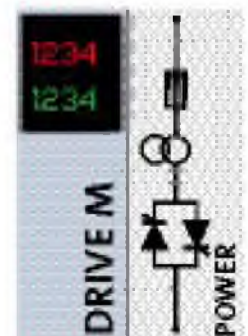
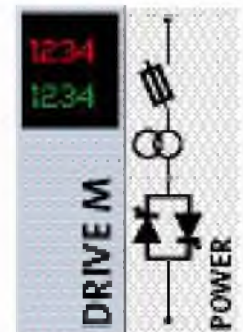
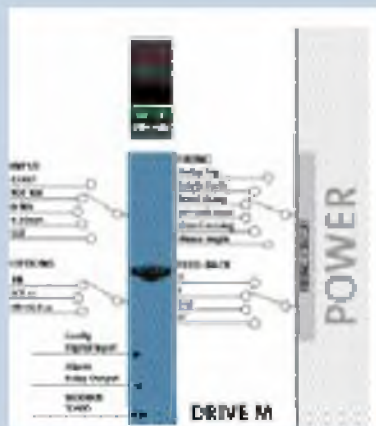
Relay M has been designed to meet the most demanding applications in a simple way.

- Single and three phase thyristor units up to 210A
- Relay is a true universal unit where it is possible to select the control mode and firing type with the unit online and working. This allows the unit to establish starting and running strategy for power load management
- RS485 comm Modbus protocol and other standard bus protocols are available
- Dual front panel display that allows full configuration of the unit when a PC or PPC and configuration software are not available
- Front panel indication of current, voltage and power value plus all the other parameters at different security levels
- Selection of voltage and power control modes with added option of switching between the two modes during the process
- No special tools necessary for the engineer during start up or during any ongoing maintenance procedures, even the screwdriver can be left at home.

Relay M family

GENERAL FEATURES

- Single and three phase thyristor units up to 210A.
- RS485 comm, Modbus protocol as standard.
Other field bus protocols available as option.
- Dual front panel display that allows full configuration of the unit plus indication of the voltage, current and power and all other parameters including diagnostic and fault messages.
- The unit can be configured via:
 - Front dual display and keypad.
 - RS485 communication using PC and configuration Software
 - USB/TTL port on front unit.
- Universal unit that can be configured as:
 - Inputs: SSR, 4-20mA, 0-10V, Potentiometer and RS485.
 - Firing: Single Cycle, Burst Firing, Delayed Triggering Phase Angle on single phase units.
- Control Mode: Voltage square and Power.
- Power limit adjustable via front display or via RS485.
- Indication of current for each phase on 3 phase units.
- Heater Break Alarm with built-in current transformers available as an option.
- RMS value can be set and displayed with 0,1% resolution.
- Two digital inputs include a standard enable input plus a configurable input selectable as:
 - Voltage to Power control transfer.
 - Automatic adjustment of HB alarm.
 - Local or Remote facility.
 - Instant power adjustment in local mode via front keypad & display.
 - Reset command for alarms.
- All of these features are available via RS485 as standard.
- One digital output configurable for:
 - Thyristor in short circuit.
 - Heater Break alarm.
 - Thyristor in short circuit + Heater Break alarm.
- EMC and CE marked, cUL pending.





Relay M-1PH · 34-40-45A

- Single phase unit to control single phase loads up to 45A.
- Nominal current rated at 40°C ambient temperature.
- All features described in "GENERAL FEATURES" included as standard.
- Fuse and fuse holder included as a standard.
- Voltage Power Supply 480V or 600V AC.
- EMC and CE marked, cUL pending.

Relay M-2PH · 30-35-40A

- Two phase unit to control three phase loads up to 40A.
- Wired in delta or star without neutral.
- Voltage Power Supply 480V or 600V AC.
- Nominal current rated at 40°C ambient temperature.
- All features described in "GENERAL FEATURES" included as standard.
- Fuse and fuse holder included as standard.
- Firing: Burst Firing.
- EMC and CE marked, cUL pending.

Relay M-3PH · 30-35-40A

- Three phase unit to control three phase loads up to 40A.
- Wired in delta, star and star with neutral.
- Voltage Power Supply 480V or 600V AC.
- Nominal current rated at 40°C ambient temperature.
- All features described in "GENERAL FEATURES" included as standard.
- Fuse and fuse holder included as standard.
- Firing: Burst Firing.
- EMC and CE marked, cUL pending.



Relay M-1PH · 60-90-120-150-180-210A

- Single phase unit to control single phase loads up to 210A.
- Nominal current rated at 40°C ambient temperature.
- All features described in "GENERAL FEATURES" included as standard.
- Internal fixed fuses .5
- Voltage Power Supply 480V or 600V AC.
- MC and CE marked, cUL pending.

Relay M-2PH · 60-90-120-150-180-210A

- Two phase unit to control three phase loads up to 210A.
- Wired in delta or star without neutral.
- Voltage Power Supply 480V or 600V AC.
- Nominal current rated at 40°C ambient temperature.
- All features described in "GENERAL FEATURES" included as standard.
- Internal fixed fuses.
- Firing: Burst Firing.
- EMC and CE marked, cUL pending.


Relay M-3PH · 60-90-120-150-180-210A

- Three phase unit to control three phase loads up to 210A.
- Nominal current rated at 40°C ambient temperature.
- Voltage Power Supply 480V or 600V AC.
- All features described in "GENERAL FEATURES" included as standard.
- Internal fixed fuses.
- Firing: Burst Firing.
- EMC and CE marked, cUL pending.

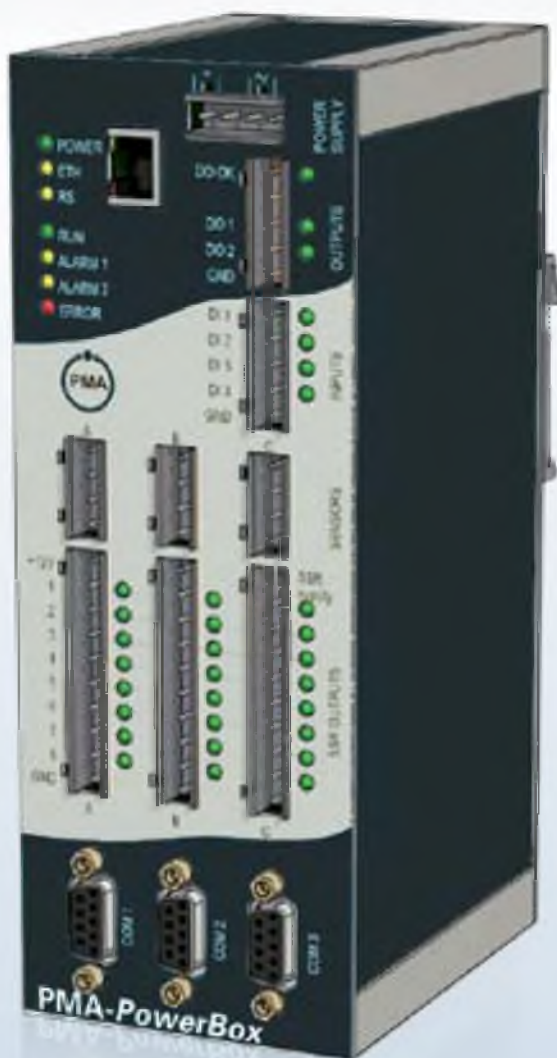
PM3000



The PM3000 is specially developed to drive high power 2/3 Phase transformer loads where it is necessary to compensate resistance change. The PM3000 can drive resistive or transformer loads with delta or star connection without neutral wire.

- PM3000E is a full digital and universal Thyristor unit based on a very powerful dedicated micro configurable via serial communication port for all inputs, firing modes, control modes and loads types.
- Integrated fixed fuses and all what is necessary to have a complete power control zone including current transformer and optional circuit board.
- Two leg switching three wires load star or delta connections.
- Suitable to drive resistive loads and three phase transformer.
- Frontal Key Pad to control the unit and to read power, current and voltage value.
- Universal Input signal with automatic zero/span calibration.
- Universal Firing modes, customer configurable via Rs485 comm. Modbus or communication port as Burst Firing, Single Cycle and Delayed Triggering.
- Power, voltage control mode.
- Unbalanced load and Heater Break Alarm.
- RS 485 port. Modbus protocol.
- Comply with EMC and 
- IP20 Protection

PMA POWERBOX



Multiple zone heating-zone management

- Synchronization up to 24 zones up to 2000 Ampere
 - Elimination of harmonics
 - Prevention of power peaks
 - No flickering of the power line
 - Optimization of the real power factor
- Automatic load detection
- Smart Power Limitation

Multi loop controller and profiler



4400 and 6400: profiling performances that are hard to beat

The 4400 can create a profile with anything from 1 to 121 segments, store up to 8 programs and configure and store extra programs on a PC.

The 6400 is a leader in its class, offering a 4 recipe, 16 free-format segment profiling capability and unrivalled ease-of-use.

4400 features:

- 'Auto Hold' facility
- Remote run hold
- Remote program select
- 4 event outputs
- Real-time clock
- Power failure recovery

6400 features:

- Fast accurate control via raPID fuzzy logic
- Saves up to 4 programs in memory
- Programming in rate or time mode
- Guaranteed soak to protect production quality



ProVU: advanced controller with profiling and datalogging

ProVU with real text/graphic LCD screen is designed to improve user efficiency with many features integrated to reduce commissioning time, simplify operation and minimise downtime.

The versatile display options, USB port, profiling, datalogging and profiling functions are a unique combination in a standard 1/4 DIN controller. The controller can be set-up quickly and easily, a wizard starts automatically on first start-up for step-by-step configuration.

Features:

- Single or dual loop
- Multilanguage option
- Colour change LED backlight on alarm (Green/Red)
- Trend view
- 255 segment profiler to allocate in up to 64 programs
- USB port for access to configuration and log files
- Log process values, setpoints and alarms to .csv file
- Cascade control
- Ratio control
- 2nd universal input also for monitoring
- BlueControl configuration and commissioning software
- Valve motor control



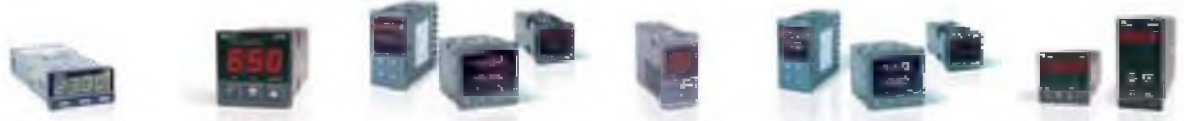
MLC 9000+: compact multi loop controller

An MLC9000+ system comprises 1 to 8 Control Modules. 1, 3 & 4 loop modules are available (control up to 32 loops per system), with heater break options on 1 and 3 loop modules. Communication options for connecting to a PLC, HMI, PC or SCADA include Modbus, Devicenet, PROFIBUS, Ethernet I/P and Modbus TCP.

The MLC features a hot swap facility, a module can be replaced and back in service within 30 seconds due to automatic reconfiguration.

Using a MLC system can reduce installation time and cost when compare to standard single loop controllers. The MLC 9000+ involves less wiring with no need for panel cut-outs.

Technical Data



Model Number	2300	6500	P6100, P8100, P4100	8800	P6170, P8170, P4170	6600, 8600
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Dimensions

DIN Size	1/32	1/16	1/16, 1/8, 1/4	1/8	1/16, 1/8, 1/4	1/16, 1/8
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Display

Display type	LED	LED	LED	LED	LED	LED
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Inputs

Thermocouple/RTD	●	●	●	●	●	●
DC Linear V			●	●	●	
DC Linear mV/mA	●		●	●	●	
Remote Setpoint			○	○	○	

Outputs

Max. Number of Outputs	3	2	3	3	4-5	4
Relay	○	○	○	○	○	○
SSR Driver	○	○	○	○	○	○
DC Linear			○	○	○	○
Triac			○	○	○	○
Transmitter PSU			○	○	○	

Features & Functions

PID Control	●	●	●	●	●	●
Number of control loops	Single	Single	Single	Single	Single	Single
ON/OFF Control	●	●	●	●		●
Max. Number of Alarms	2	1	2	2	2	2
Retransmission Output			○	○	○	○
Heater Break Alarm				○		●
RS485 Communications	○		○	○	○	○
Modbus/TCP Ethernet Comms						

Tuning

Pre-tune	○		●	●	●	●
Easy-tune	●	●				
Self-tune			●	●	●	●
Manual Tuning	●		●	●	●	●

Power Supply

100–240V AC	○	○	○	○	○	○
20–50V AC/22–65V DC		○	○	○	○	○
12–24V AC/12–30V DC	○					

Function

Indicator	○					
Temperature Controller	○	●	●	●		●
Process Controller	○		●	●		
Valve Controller				●	●	
Limit Controller						
Profiler / Controller						
Datalogger						

- Fitted as Standard
- Option



P6010, P8010

8080

P6700, P8700,
P4700

6400

4400, 8840

ProVU

MLC, 9000+

1/16, 1/8

1/8

1/16, 1/8, 1/4

1/16

1/8, 1/4

1/4

DIN Rail

LED

LED

LED

LED

LED

Graphic/text LCD

●	○	●	●	●	●	●
●	○	●	●	●	●	●
●	○	●	●	●	●	●
					○	

4-5	3	3	3	3	9	48
○	○	○	○	○	○	○
○		○	○	○	○	○
○	○	○	○	○	○	○
○		○	○		○	
○		○			○	

			●	●	●	●
			Single	Single	Single or dual *	Up to 32
5		3	2	2	5	64
○	○	○	○	○	○	○
						○
○	○	○	○	○	○	○
					○	○

			●	●	●	●
						●
				●	●	●
			●	●	●	●

○	○	○	○	○	○	
○	○	○	○	○	○	
						18-30V DC

●	●				●	●
					●	●
				○	●	
		●				
			●	●	○	
					○	

* independent or cascade control

Full Range – from Basic to Advanced



6500: basic 1/16 DIN controller

The 6500 is a simple, no frills 1/16 DIN controller offered at a competitive price.

Added to this are excellent display characteristics represented by a highly visible three-digit display and clear go/no go indication.

Features include:

- Easy Tune (PID) or On/Off
- Setpoint lock
- On control indicator
- Alarm lock
- Optional process alarm
- Adjustable PV offset

The benefits of the 6500 are:

- straightforward operator interface
- simple set-up
- ease of use
- a fast 'up-time' over a defined range



6100+/8100+/4100+: discrete temperature controllers

The Plus series controllers combine sophisticated functionality with in-built versatility and ease-of-use to provide a range of controllers to suit most process environments.

Because their inputs and outputs are all plug in, including relay, SSR, triac, linear and digital, they can be easily customised as required.

Other features include:

- Jumperless configuration – one less area for potential error
- Auto-hardware detect/set-up – to reduce set-up times
- Remote setpoint (RSP) and transmitter power supply (TxPSU) options
- Configuration via PC/Customisable operator menu
- Improved, easy to use HMI – making set-up process quick and easy



8800/8840: advanced temperature & process controllers

The 8800/8840 controllers offer the best in advanced process control for demanding applications. They provide a choice of simple 2-point (on/off) control, continuous PID control or VMD (valve motor drive).

Every 8800 and 8840 comes fitted with 4 process outputs – either relays or up to 2 universal outputs that can be used for operating a solid-state relay, linear current/voltage output or to power a two-wire transmitter.

Features include:

- Front Comms port & PC configuration software
- 2 or 3 Analogue inputs
- Valve motor drive with/without position feedback
- Maintenance manager and error list
- Self tuning to the setpoint without oscillation
- High visibility display sharing plain text or bargraphs

Indicators with Versatility



2300: basic 1/32 DIN controller/indicator

The 2300 is available as a controller or indicator. Small size does not come at the expense of features; it has large displays, 2 amp relays and full 3-wire PT100 inputs.

This 2300 has a 4 digit display that can be specified in either red or green. It also offers 3 additional multi-colour LEDs to indicate alarm status and configuration mode.

The controller features our hands-free Easy Tune algorithm, full universal inputs and a relay output. The 2300 indicator has universal input options which include Thermocouple, RTD & DC.

Features include:

- 3-Wire PT100, T/C or mV/mA Input
- 0.1% Accuracy
- Up to 2 process alarms
- Manual/Easy Tune
- Setpoint Lock
- On Control Indication



8080 Indicators: process changes at a glance

The West 8080 offers highly accurate process monitoring and unparalleled display quality. It features a custom-designed LED 5 digit display which offers larger, clearer numbers than other instruments of the same size.

There is a choice of colour for the display and this can be set up to change (green to red) to indicate alarm status.

With either temperature or process inputs available and a choice of alarm and retransmission outputs, the 8080 can serve most process indication requirements.

Features include:

- Security lock
- Colour change on alarm
- Process transmitter PSU
- Min/max value hold
- PV retransmit option
- 2 process alarms
- RS485 Comms



6010+ 8010+ Indicators: a versatile and highly visible option

The 8010+ and 6010+ are a new range of panel indicators, designed for use in a wide variety of applications. They offer fast, accurate and easy to read displays; together with quick and simple set-up procedures.

The 8010+ provides a new dual-colour display option; it is now available with red, green, or green to red colour change displays.

Plug-in modules allow PV retransmission or Transmitter Power Supply and up to 5 alarm relays on the 8010+ and up to 4 on the 6010+.

Features include:

- Up to 5 outputs
- Tare function
- Modbus and ASCII Communications
- PC Configuration
- Self-recognition of option boards
- Jumperless configuration

Chart recorders, thyristors and sensors



Chart Recorders: for hard copies of all process activities

West Instruments distributes a wide range of Partlow brand digital (microprocessor based) and analogue circular chart recorders. The range provides reliable operation in rugged environments – from light industrial through to extreme industrial wet applications to industry specific flow and relative humidity applications.

Applications include: Plastics forming/ Industrial Ovens/Food Processing/ Pharmaceutical and Chemical Processing and Pulp and Paper Processing.

Circular chart recorders range in sophistication from a basic one-pen one-process recording instrument to a multiple input, multiple-equation profiling recorder.

They are easily programmable via a front-panel keypad or via serial PC communication.



Thyristors: problem solvers in many guises

Thyristor units are available from 10-2600A, including single, two and three phase units.

The range includes innovative products to solve all of the most commonly encountered application problems, integrating state-of-the-art technology for the ultimate product performance.

There are a wide range of outputs, options and firing types available, including burst and phase angle firing and zero crossing.

Also available is an industrial thyristor package, normally used in applications where many zones are operating (co-extrusion, blow moulding, thermoforming machines and in furnaces to model flat glass etc.).



Sensors: models available for almost every need

With over 30 years supplying experience of sensors, West's range offers a combination of performance and quality that is hard to beat.

These high quality temperature sensors can be manufactured in many styles, from a simple welded junction joining two dissimilar metals, to mineral-insulated sensors with waterproof connecting heads and adjustable process fittings.

The diverse range of designs means there will be one ideally suited to just about any installation or application.

Which Controller?



Pro 16

- 1 universal input + 1 optional
- Up to 4 digital inputs
- Heater or remote setpoint current input
- Customer specific linearization for sensors
- Transmitter power supply
- Up to 6 outputs
> relay, logic, SSR, linear DC

Pro 8

- 1 universal input + 1 optional
- Up to 3 digital inputs
- Heater or remote setpoint current input
- Customer specific linearization for sensors
- Transmitter power supply
- Up to 6 outputs
> relay, logic, SSR, linear DC

Pro 4

- 2 universal inputs + 1 optional
- Up to 3 digital inputs
- Heater or remote setpoint current input
- Customer specific linearization for sensors
- Transmitter power supply
- Up to 6 outputs
> relay, logic, SSR, linear DC

16 segments x 16 profiles

10 segments

16 segments x 16 profiles

RS 485 communications

RS 422/485 Modbus RTU interface
MODBUS master configurable

Profibus DP and RS 422/485 Modbus
RTU interface

1 x Line - 7 Segment LED
1 x Line - Text

2 x Line - 7 Segment LED

2 x Line - 7 Segment LED
1x Line - Text
Day & Night Display



- Laboratory and Test Equipment
- Boiler & Steam Processes
- Food & Beverage
- Packaging

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Fast parameter configuration

BlueControl® software enables parameters to be set up quickly and safely through use of plain texts, a clear menu structure and online help.

Clone other devices - ideal for OEMs

The software provides the ability to copy, edit and save settings **simplifies the set up process** for multiple controllers.

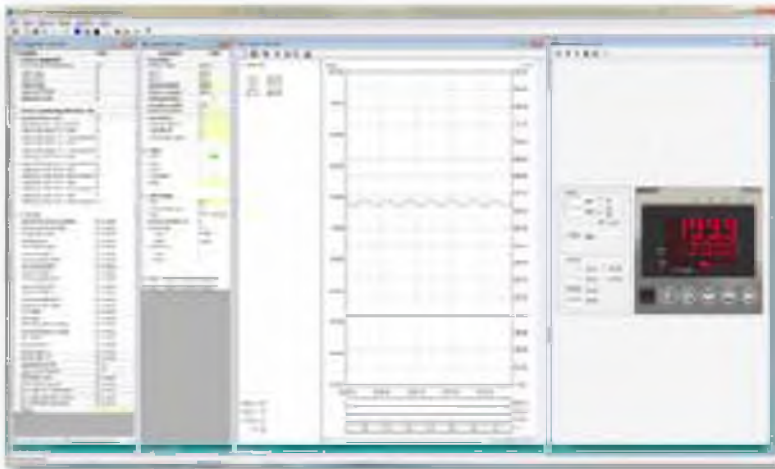


Simulator for process testing before going live

The software offers a **sophisticated simulator** allowing settings to be tested in a virtual environment before setting the process live. This valuable functionality allows **complete peace of mind** during the set up process.

Increase efficiency with remote management

Users are able to **monitor and adjust processes remotely**. This flexibility provides greater levels of process control as well as offering **better visibility** for improved management.



Familiar software environment for ease-of-use

BlueControl® uses established MS Windows operating standards as well as familiar operating elements and menu structures of MS Office programs, making it an **easy-to-use environment** that users quickly become familiar with.

PMA, WEST, CAL and Partlow, four internationally successful companies from the Danaher Corporation, have joined together to form one network under the umbrella brand "WEST Control Solutions". PMA is the brand for arduous applications with high-end functionality; WEST groups a flexible range of standard controllers into one portfolio; CAL offers a series of controllers for simple and economical applications; Partlow rounds off the product spectrum with devices for measurement data acquisition.

Profit from synergies that result from the pooling of expertise in the most diverse of application areas, and trust our core expertise: an extensive product portfolio, many years of experience, flexibility, meet tight to deadlines and competent consultation services.

Optimum process workflows are guaranteed thanks to approved management systems and ISO 9001-certified quality management.



Rely on flexibility – our scope of features

Functionality

- PID or ON/OFF control
- Heat only or Heat/Cool operation
- Motorised valve control
- 1 to 30 control channels
- Programmer
- Ratio controller
- External set point value
- Auto-tuning
- O₂ control
- Cascade control
- Override control
- Disturbance-variable feed-forward

Visualisation

- Standard LED display
- LED display with plain text display
- Full graphic display

Communication options

- Profibus DP
- ProfiNet
- Ethernet IP
- ModBus RTU, ModBus TCP/IP
- ISO 1745
- CANopen
- Interbus S

Software tools

- Controller configuration
- Controller simulation
- Start-up/optimisation tool

Individual solutions

- Depending on customer requirements
- Depending on area of use
- Depending on process application

For special applications

- Data collection: Paper scriber/paperless scriber
- Sensor technology: Temperature sensors/pressure sensors
- Actuators: SSRs/thyristors/power management systems

Controller formats



Save time and costs with distributed automation

Decentralized installations with field bus systems are finding increasing use in process and machine automation. In order to ensure reliable control in these allocations – also involving complex processes – modular components with additional functionality are required. With the flexible rail line system, WEST Control Solutions offers a comprehensive product portfolio for decentralized automation.

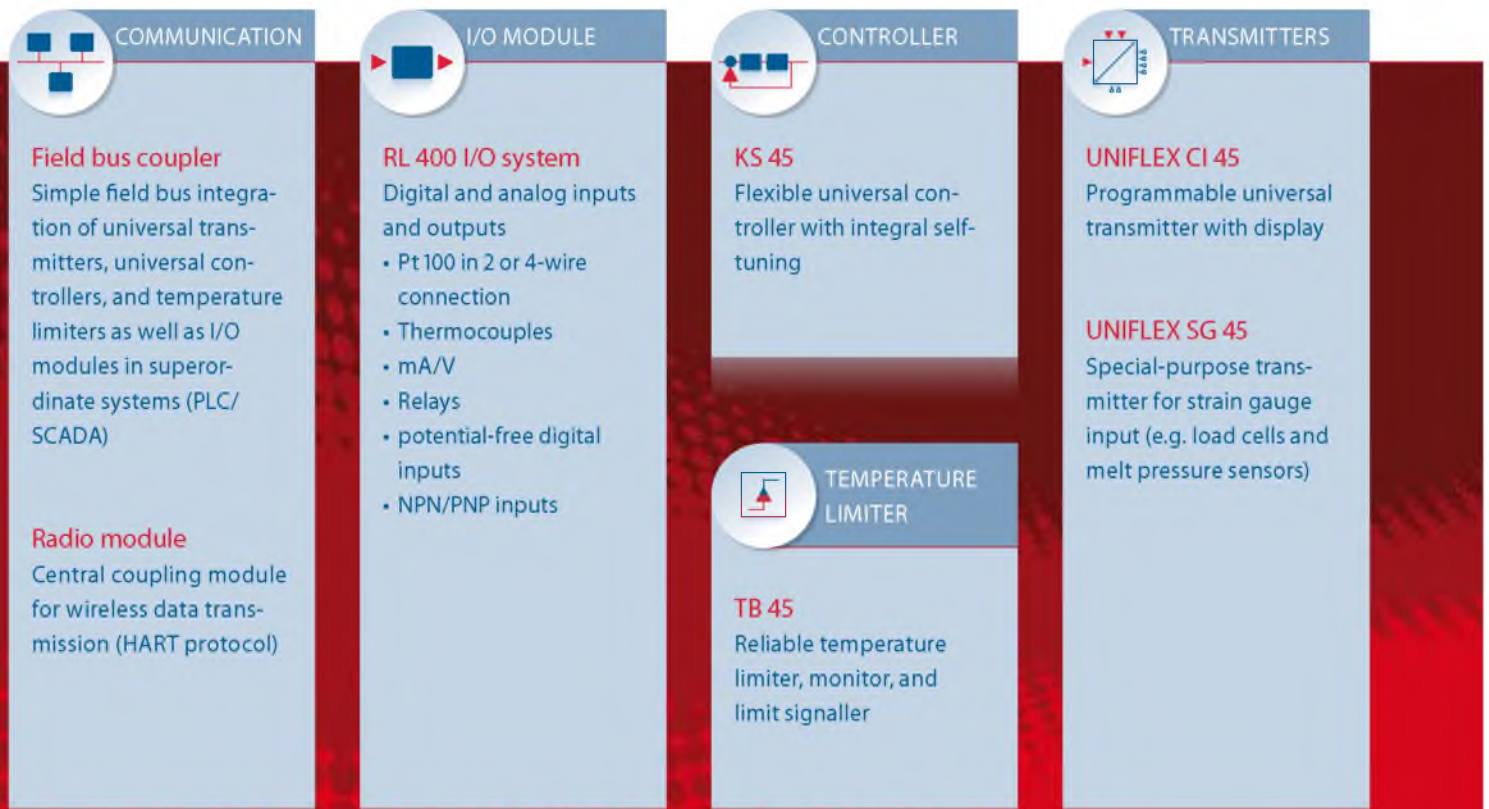
The combination of RL field bus couplers (for Profibus, CAN, Modbus TCP, and Modbus RTU) with radio module, I/O module RL 400, KS 45 universal controller, Uniflex CI 45 and SG 45 transmitters, and the TB 45 temperature limiter, permits modular systems with distributed intelligence to be created.

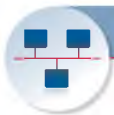
Thanks to the space-saving modules for 'top hat' rail mounting, and other universally applicable system components, rail line helps to save time and costs during system configuration, engineering, and commissioning.

The features

- Range of intelligent devices for decentralized automation
- Cost-saving 'top hat' rail mounting technology
- Compact design
- Comprehensive stand-alone functionality
- Field bus coupler for Profibus, CAN, Modbus TCP, Modbus RTU, and Ethernet IP

rail line: The system at a glance

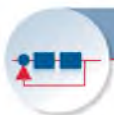




COMMUNICATION

Field bus couplers RL DP / RL ETH-IP / RLCAN, and RTU radio module

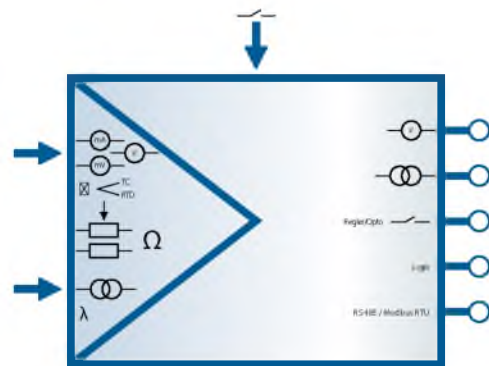
- RL DP for Profibus DP
- RL Ethernet IP
- Modbus/TCP protocol
- RL CAN for CANopen
- Modbus RTU
- Central power supply



CONTROLLER

KS 45

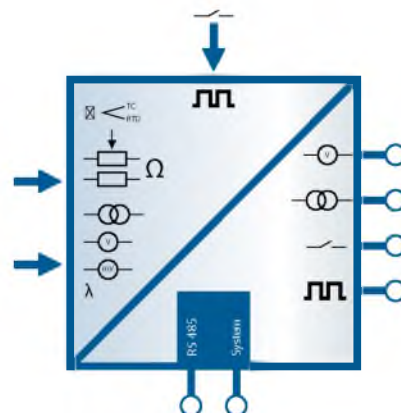
- Display- and operating functions
- 2-point, 3-point, motor valve, and continuous control
- Fast sampling rate
- Two universal inputs possible
- Universal output
- Timer and programmer
- Customized linearization profile
- Auto/manual switchover
- Direct connection of RS 485 Modbus RTU without bus coupler. Inter-module connections permit additional controllers, transmitters, and limiters to be fitted without wiring.



TRANSMITTER

CI 45

- High resolution
- Fast sampling rate
- Two universal inputs possible
- Universal output
- Two relay outputs
- Counter/frequency input, frequency output
- Customized linearization profile
- Correction of measurement value
- Slave pointer (min/max indicator)
- Direct connection of RS 485 Modbus RTU without bus coupler. Inter-module connections permit additional controllers, transmitters, and limiters to be fitted without wiring.



Compact, multi-functional and flexible

System features

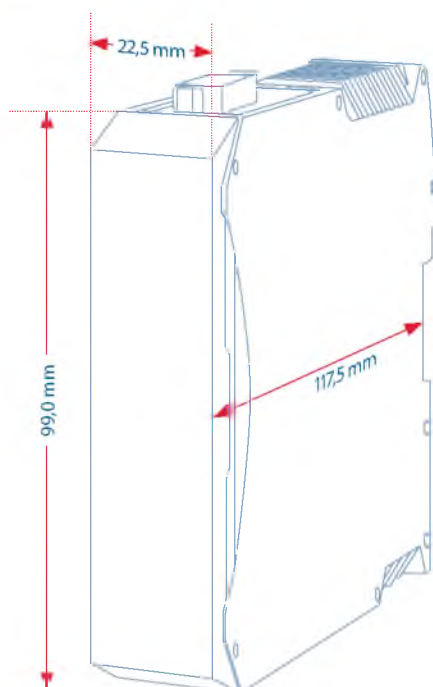


- Inter-module connections without wiring
- Space-saving rail mounting
- Communication via field bus coupler
- Hot swap facility



- Plug-in screw terminals or spring-clamp connectors

MODULE FEATURES



Technical details

- Field bus coupler for Profibus, CAN, Modbus TCP, Modbus RTU, and Ethernet IP – ensures cost-effective and convenient connections to PLC, IPC, and operating terminals
- Bus monitoring
- Pre-defined output states in case of communication failure
- Compact design – modules only 22,5 mm wide
- 3-key operation, and multi-line LC display
- Plug-in terminals – no wiring to disconnect in case of module replacement
- Module replacement during operation (hot swap)
- BluePort® front port
- PC configuration tool BlueControl®
- Cost advantages during projecting, implementation, and maintenance
- Local operation
- Freely configurable menu structure
- Freely selectable monitoring functions

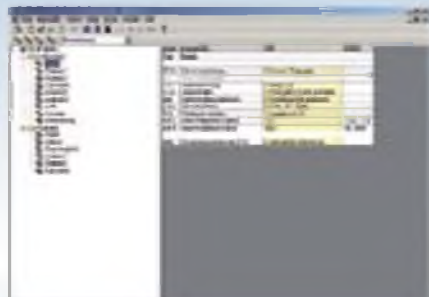
BlueControl®: The Engineering Tool

On-site commissioning, and remote configuration

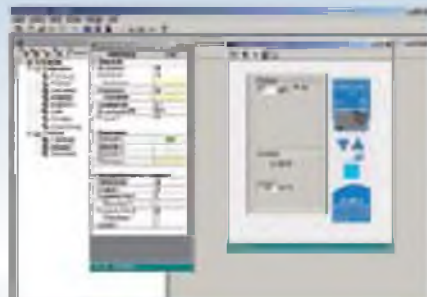


- Powerful tool for setting parameters, simulation, commissioning, and diagnosing
- Fast configuration and commissioning of the system via the BluePort® front interface on the field bus coupler
- Reliable copying of device parameters
- Settings are tested with the built-in device and process simulation
- Archiving and documentation

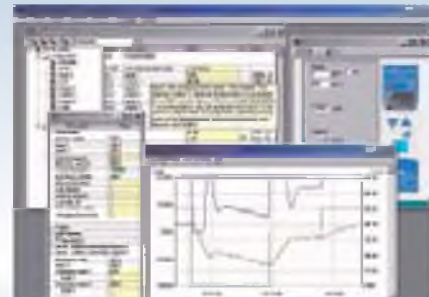
Configuration



Device simulation



Trend recording



Consolidated diversity

BluePort® and BlueControl® open up new controller perspectives

Interface and software tool make universal controllers into versatile specialists

The distinguishing feature of the BluePort® controller family from PMA is the interface connection on the front for direct access to a PC or a laptop. The BlueControl® software tool makes it possible to completely configure these universal controllers. In this way, the universal device becomes an application-specific

specialist. BluePort® controllers are available in all standard housing formats.

Set controller parameters in a matter of seconds
The BluePort® interface on the front of the device and BlueControl® software can be used to carry out the desired operations quickly and easily. The PC software has been designed to facilitate the configuration, parameterisation and

operation (commissioning) of the controllers. In so doing, all settings are archived and, if necessary, printed out.

Certain versions also include a powerful data acquisition module with trend graphics. In the simulation mode, the practical suitability of the selected function can even be tested in advance on the PC and commissioning can be monitored with a trend curve display.

BluePort® controllers at a glance



KS 40-1



KS 50-1



KS 90-1

KS 92-1



TB 40-1



DIGITAL 280-1

Controllers

KS 40-1: The KS 40-1 compact controller is suitable for all thermal control operations which are handled by switching controllers – 2-point, 3-point or 3-point stepping characteristics. Three relay outputs are available for this purpose and the analog universal output makes the device into a continuous controller.

KS 50-1: Designed for use in plastics processing machinery, the KS-50-1 can be adapted to every task: from high-speed hot runners to slow mould temperature control with special functions. Extra inputs and outputs make it possible to start special functions, for example, or to monitor temperature profiles without

additional PLCs. Moreover, the Modbus interface can be used to quickly integrate the KS-50-1 controller family into networks.

KS 90-1 / KS 92-1

The industrial and process controllers of the KS 9x-1 family take 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 second analog input can be used to measure heating current or to connect lambda sensors directly to the device. The optional third input serves as a universal input to perform a wide range of additional functions, such as temperature-

dependent setpoint correction, derivative-action control, etc. In the program controller variant (KS 9x-1 programmer), both controllers offer extensive programmer functions.

Temperature limiter

TB 40-1: The TB 40-1 temperature limiter has been type tested to DIN standards, can be used for heating and refrigeration processes, and is suitable for all thermocouple types and resistance-type sensors.

Indicator

DIGITAL 280-1: The convenient DIGITAL 280-1 universal indicator with its exceptionally large display rounds out the BluePort® controller portfolio.

All down the line

rail line modular DIN rail mounting system

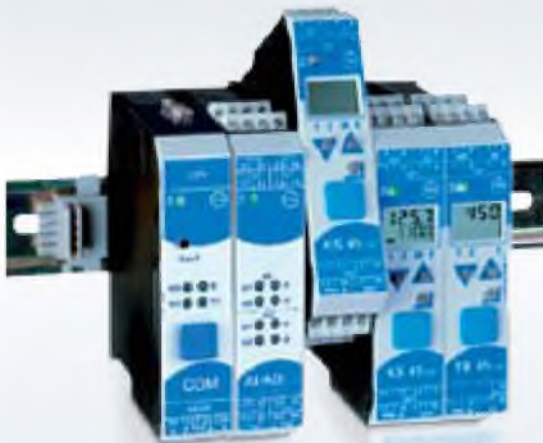
rail line provides a comprehensive product range for decentralised automation. The KS 45 universal controller, the Uniflex CI 45 and SG 45 transmitters, the TB 45 temperature limiter combine with the RL field bus couplers for Profibus, CAN, Modbus TCP, Modbus RTU and Ethernet IP, the wireless module and the RL 400 I/O module to form a flexible system with distributed intelligence. Separate compact modules, plug-in

screw terminals or spring-clamp connectors, space-saving rail mounted installation and universal system components save time and money during engineering development and in operation. The integrated BluePort® front interface and the BlueControl® software tool can be used to implement tailor-made solutions. The desired functions are easily selected, compiled and reproducibly archived by means of a PC.

Benefits

- Range of intelligent devices for decentralized automation
- Cost-saving 'top hat' rail mounting technology
- Compact design
- Comprehensive stand-alone functionality
- Field bus coupler for Profibus, CAN, Modbus TCP, Modbus RTU, and Ethernet IP

The rail line system at a glance



RL 400 I/O-system KS 45 TB 45 UNIFLEX CI 45

Communication

Field bus coupler: Simple field bus integration of universal transmitters, universal controllers, temperature limiters and standard I/Os

Radio module: Central coupling module for wireless data transmission

I/O module

RL 400 I/O system: Digital and analog inputs and outputs

- Pt 100 in 2 or 4-wire connection
- Thermocouples
- mA/V
- Relay
- Potential-free digital inputs
- NPN/PNP inputs

Controller

KS 45: Flexible universal controller with integral self-tuning

Temperature limiter

TB 45: Reliable temperature limiter, monitor and limit signaller

Transmitters

UNIFLEX CI 45: Programmable universal transmitter with display

UNIFLEX SG 45: Special-purpose transmitter for strain gauge input (e.g. load cells and melt pressure sensors)



KS 90-1 KS 90-1 prog.	KS 92-1 KS 92-1 prog.	KS 94	KS 98-1	KS 800	KS 816	KS vario modulares Regelsystem	KS 108
Industrial and process controller/ Program controller	Industrial and process controller/ Program controller	Industrial and process controller	Multi-function unit	Multi-temperature controller	Multi-transmitter Multi-temperature controller	Modular control system	Compact automation unit
48 x 96 x 118	96 x 96 x 118	96 x 96 x 160	96 x 96 x 160	1024 x 170 x 85	1024 x 170 x 85	139 x 120 x 71 (Regler und Buskoppler)	194 x 172 x 50
Pins or screw terminals	Pins or screw terminals	Pins or screw terminals	Screw terminals	Plug-in terminal blocks	Plug-in terminal blocks	Plug-in spring-clamp connectors	Plug-in screw terminals or spring-loaded terminals
1/3	1/3	1/3...5	3...26/3...85	8/9	16	4...30/4...34	> 20
100 ms	100 ms	200 ms	200 ms	625 ms	1 sec	≥ 100 ms	> 20 ms
BlueControl®	BlueControl®	Engineering Tool	Engineering Tool BlueControl®	-	-	-	Modular I/O system RL400
●	●	●	●	-	-	-	Modular I/O system RL400
-	-	-	-	●	-	up to 4 summing current inputs	Modular I/O system vario IO
●	●	●	●	-	-	-	Modular I/O system RL400
●/-	●/-	●/●	●/● Mathematical functions	-	-	-	● Function library
●	●	●	●	●	-	●	●
Universal output	Universal output	●	●	20 mA outputs	-	max. 60 Universal outputs	Modular I/O systems RL400, vario IO
Relay, logic, continuous, optocoupler	Relay, logic, continuous, optocoupler	Relay, logic, continuous	Relay, logic, continuous	Logic, continuous	-	max. 60 Relay, logic, continuous	Modular I/O systems RL400, vario IO
●	●	●	●	●	●	●	●
●/●	●/●	●/-	configurable	Via digital inputs	-	Via digital inputs	●
max. 4	max. 4	max. 4	2...362/ configurable	3	-	max. 60, Memory	Modular I/O systems RL400, vario IO
Ramp 16 x 16	Ramp 16 x 16	3 x 16	> 1000	2 per zone	2 per zone	2 per zone	> 5000
max. 3	max. 3	max. 12	2...362	max. 4	-	max. 320 digital inputs	Modular I/O systems RL400, vario IO
BlueControl®	BlueControl®	ET 94	ET 98plus BlueControl®	BlueControl®	BlueControl®	RS232 port for BlueControl®	USB/-

● as standard

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