

6060 INDUSTRIAL CONTROLLER QUICK START MANUAL PK518 0037-75536



CAUTION: Installation should be only performed by technically competent personnel. Local Regulations regarding electrical installation & safety must be observed. The host equipment is required to provide a suitable electrical, mechanical and fire enclosure to meet relevant safety standards. Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.

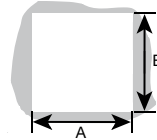
1. INSTALLATION

Panel-Mounting

The mounting panel must be rigid, and may be up to 6.0mm (0.25inch) thick. Cut-out sizes:

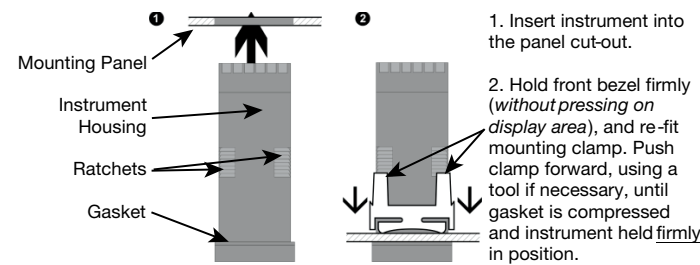
Cut-out Dim A
1/16 DIN = 45mm

Cut-out Dim B
1/16 DIN = 45mm



For *n* multiple instruments mounted side-by-side, cut-out A is 48*n*-4mm.

Tolerance +0.5, -0.0mm



CAUTION: For an effective IP65 seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

It is essential that the controller is installed with a minimum of 20mm of free space around the case in order to allow adequate ventilation.

Rear Terminal Wiring

All connections to the device must be made through a spade format or similar connection, with connection to the spade terminal touching both the insulation and conductor material. (Use a standard crimping tool).

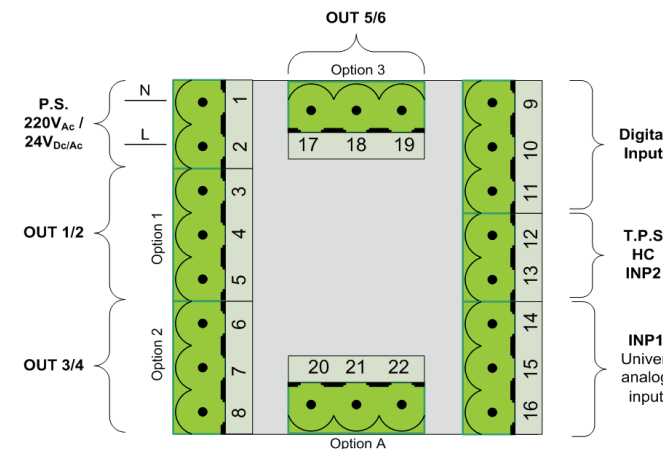
All connections must be mechanically secured so as to prevent any wiring becoming loose and coming in contact with other wires or the instrument casing.

The above applies to any and all connection to hazardous mains supply either direct or indirect (through a switch or relay).

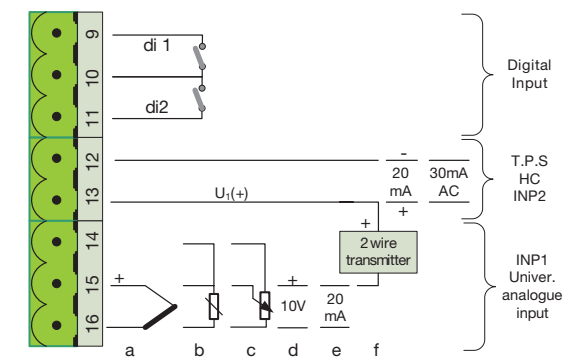
Use copper conductors (except for T/C Inputs).
Use Screened Cable on Retransmission Options

Single Strand wire gauge: Max 1.2mm (18 SWG)
Cabling must have a minimum temperature rating of 80° C.

Assignment of connectors to options modules:

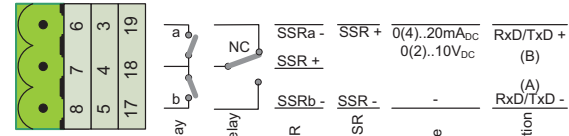


Assignment of connectors to options modules:

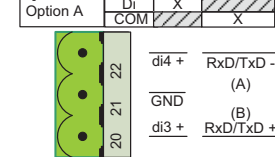


Options 1, 2, and 3:

Option	OUT1	OUT2	OUT3	OUT4	OUT5	OUT6
Option 1	x	x	x	x	x	x
Option 2	a	x	a	x	x	x
Option 3	b	x	b	x	x	x



Option A



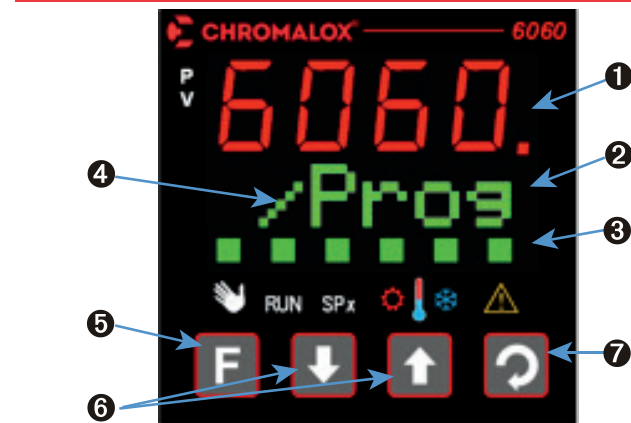
CAUTION: Check information label on housing for correct operating voltage before connecting supply to Power Input Fuse: 100 - 240V ac - 1A anti-surge 10A breaking capacity at 250V & 24V ac/dc - 315mA anti-surge 3.5A breaking capacity at 48V



Electrical shock can result in death or serious injury. Avoid contact with the leads and terminals. High voltages that may be present on leads can cause electrical shock.

Note: At first power-up please check that settings of input and output usage fit to your needs and wiring.

2. FRONT PANEL AND OPERATION BASICS



- 1 Process value display
- 2 Set-point, controller output or parameter
- 3 Status LED indicators – see next column
- 4 Ramp gradient is active
- 5 F-key to alter or activate functions
- 6 UP/DOWN to change set-point or controller output value
- 7 ENTER to accept value and show next screen

Standard LED Indicators

	Manual mode is active
RUN	Timer or profiler is active
SPx	Setpoint SP.2 or SP.E is in use
	Heat / valve open output is active
	Cool / valve close output is active
	Alarm is active

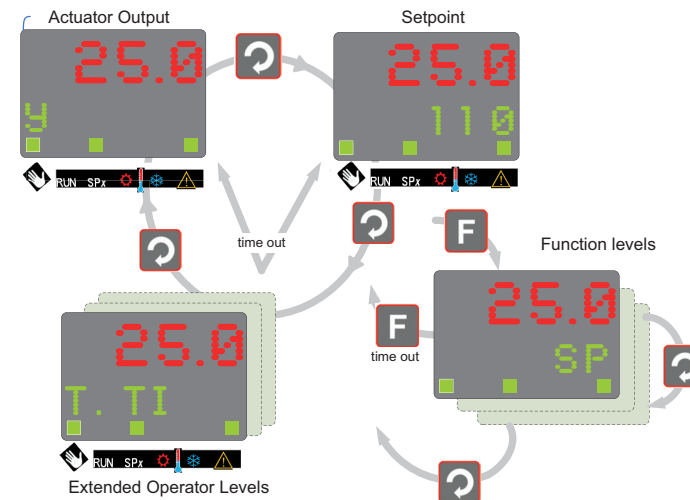
Behavior After Power-on

After the supply voltage is switched-on, the unit starts in the operator mode. The unit will be in the condition in which it was before power-off. If the controller was in manual mode before power-off, the controller starts with the last output value before power-off.

Operator Screens

In operator mode the unit displays the key screens for controller operation. Two screens for the controller (PV with setpoint or output value) and one for the profiler (if configured). The operating level can be expanded with an "Extended operating level"

Furthermore the user can access the "function level" with the F-key.



The content of the extended operating level and the function level is based on configurations made with the configuration utility ChromaloxPro. Parameters used frequently or important measured values can be placed into the extended operating level.

See the full user manual for details. Download at: <http://www.chromalox.com>

3. CONTROLLER OPERATION

This is the start screen in controller mode. The upper display line always shows the process value. The lower line is used for the setpoint.

A second screen shows the output value in the lower line. The status line has six LED beacons which indicate the following (left to right): controller in **manual** operation, **timer or program is active**, alternative **setpoint** used, **heat mode active** or valve open, **cool mode active** or valve close and limit **alarm** active.

Changing the Setpoint

The setpoint can be adjusted by pressing the UP/DOWN-keys.

Control Functions

The F-key opens the function list in the lower display line. Depending on configurations (LOGI) the list contains the following groups of parameters:

Err.....	No reset of the error list	SP.E.....	External setpoint active
Ereset....	Resetting the error list	SP.2.....	Second setpoint active
SP.....	Internal setpoint active		

On	Controller/Signaler and Limit 1 are active
Off	Controller/Signaler and Limit 1 are switched off
Auto	Automatic operation
Man	Manual operation
Loc	Local-operation adjustment via front-panel possible
rem	Remote-operation adjustment via front-panel not possible
b1c.P	Configuration-, parameter and calibration-level blocked
b1c.C	Configuration-level blocked
u.b1c	All blocking cancelled

After opening the list the display will show the actual setting of the first section. Use the ENTER key to scroll to the next section and UP/DOWN-Keys to select functions. To activate the selected setting press ENTER or just wait 2 seconds before proceeding to the next screen.

Example: Select setpoint SP.2
Press the F-key (display will show Err)
Press ENTER until you see SP, SP.E or SP.2
Select SP.2 with the UP/DOWN-Keys
Press ENTER to activate
Press the F-key to leave the function level

Self-Tuning

If the permissions in the configuration menu allow, self-tuning can be initiated by simultaneously pressing the UP and ENTER key. The lower display line will toggle between the setpoint and the self-tuning state. Press the same keys to abort an active self-tuning.

Please refer to the full manual to learn about the meaning of the state messages and see the different optimization methodologies available.

See the full user manual for details. Download at: <http://www.chromalox.com>

4. PROFILER OPERATION

Operating the Profiler

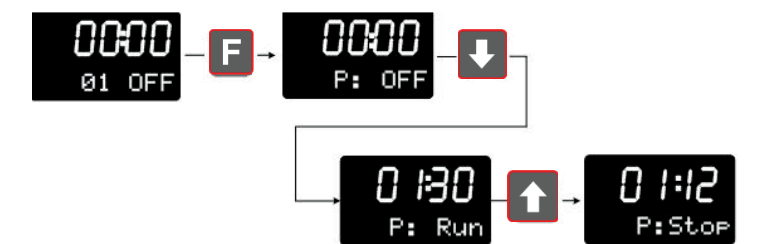
The F-key opens the profiler control menu in the lower display line. The display will show "P:" followed by the actual state. Depending on the configuration, the menu allows the user to select RUN/stop or RUN/stop/reset with the UP/DOWN-keys. Press ENTER to make the selected state active.

OFF	Stop program execution and reset
Stop	Stop program execution
RUN	Start program execution

The profiler start screen is shown above. The upper display line shows the program or segment execution time.

The lower line shows the program-number or segment-number and the state of the profiler. Details for both lines can be configured.

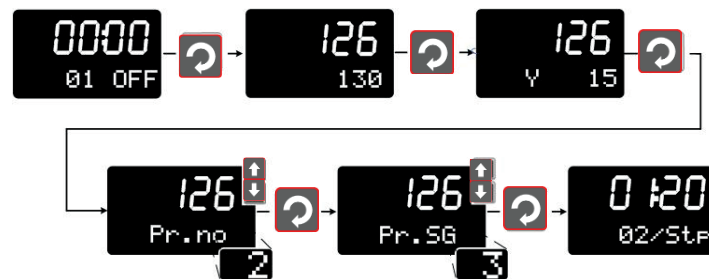
Screen sequence shown below:



Program/Segment Selection

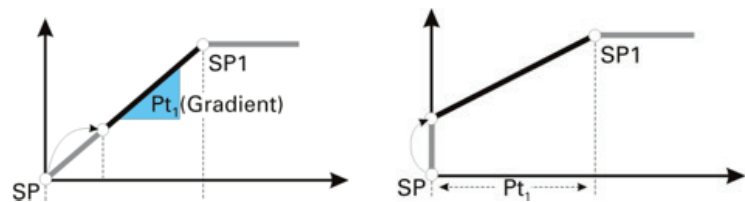
Prerequisite: Programmer is in the reset or stop condition and program / segment selection (Pr.no / Pr.SG) in the extended operating level.

The procedure to select a defined program (Pr.no) followed by a segment (Pr.SG) is shown below. When starting the programmer now, program operation starts at the beginning of the selected segment in the selected program.



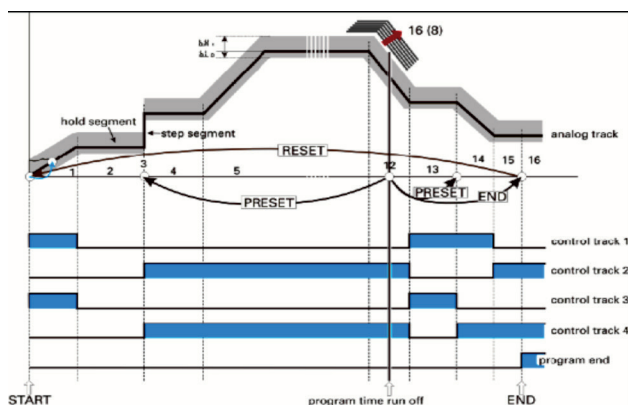
Search Run at Programmer Start

The programmer starts the first segment at the actual process value (search run). This may change the effective runtime of the first segment.

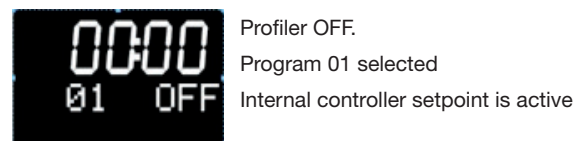


General Profiler Overview

Programs	16
Control outputs	4
Segments	16 per program
Segment types	ramp (set-point and time) ramp (set-point and v gradient) hold segment (holding time) step segment (with alarm suppression) end segment All segment types can be combined with "Wait at the end and call operator"
Time units	configurable in hours:minutes or minutes:seconds
Maximum segment duration	9999 hours = 1 year 51 days
Maximum program duration	16 x 9999 hours = > 18 years
Gradient	0.01°C/h (/min) to 9999°C/h (/min)
Program name	8 characters, adjustable via ChromaloxPro software
Bandwidth control	bandwidth high and low (b.Lo,b.Hi) limits definable for each program



Examples of Profiler Displays:



Profiler in run mode
Program 02 or Segment 02 active
Setpoint is ramping up "r"

End of Program
The last setpoint remains active

See the full user manual for details. Download at: <http://www.chromalox.com>

5. ALARM MESSAGES

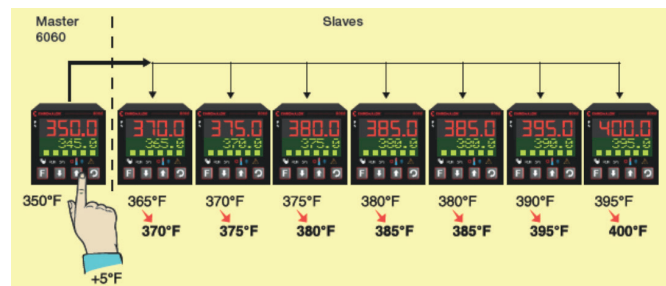
In case of an alarm the lower display line will toggle between red and green and an alarm screen will be added to the list of operator screens. Navigate to the alarm screen by pressing the ENTER-key. You will find one of the following messages:

Alarm	Description	Corrective Action
Fbf.1/2/3	Feedback failure Input 1/2/3	Check sensor and wiring
Sht.1/2/3	Short circuit Input 1/2/3	Check input wiring
PDL.1/3	polarity reversal Input 1/3	Check input wiring
HCA	Heater current alarm	Check heating element and wiring
SSr	Solid state relay	Check SSR and output circuit
LooP	Loop alarm	Check fuses, heaters and wiring
AdR.H	Adaption Heat	refer to auto tuning section in full manual
Ada.C	Adaption Cool	refer to auto tuning section in full manual
Lim. 1/2/3	Limit alarm	Check process
Inf.1	Info service interval (life time counter)	
Inf.2	Info service interval (relay cycle counter)	
E.1	Hardware problem	Contact repair department /service centre
E.2	Internal problem	Check for EMC issues Try power on reset
E.4	Option module problem	Check option module fitting or contact repair department /service centre

6. SETUP AND CALIBRATION

After power-up, the controller will show the operating level in the lower level text line. The controller status is retained and will be the same as before the last power-down. To access the options for parameter set-up, configuration and calibration, press ENTER for more than 3 seconds.

This will now allow the options to be accessed: Use the UP/DOWN-keys to select the option and ENTER to go to the next option.



Sections:

- PROC: This is used to edit programs for the profiler.
- PARA: This allows access to the two sets of PID parameters, setpoint limits, scaling of input signals, alarm limits and the program selection.
- CONF: Used to select the controller function, activate the profiler, to set input types, to choose alarm functions, to assign functions to outputs and to configure the user interface.
- CAL: This section is used for calibration of the process inputs.

After choosing a section the display will show the first option of the sub-section. Use the same procedure to choose and enter the desired sub-section.

Sub-sections: (for example PARA)

- Cntr: Contains PID parameters.
- Par.2: Contains a second set of PID parameters.
- Setp: Contains setpoint limits
- Inp.1: Contains scaling and input filter

- Inp.2: Contains scaling
- Lim: Contains alarm limits
- End:

When in a sub-section, the display will toggle between the parameter name and its value. Use the UP/DOWN-keys to change settings and ENTER to move to the next parameter. When at the end of a sub-section the display will show "done" and then the next sub-section name. At the end of the sub-section list the display will show "End" and return to the operator level.

See the full user manual for details. Download at: <http://www.chromalox.com>

Note: It is highly recommended that the controller is used in conjunction with the ChromaloxPro configuration utility. This will increase ease of use, save set-up time and help prevent controller malfunction.

A demonstration version of the ChromaloxPro configuration utility is available as a free download from <http://www.chromalox.com>. The full "Expert" version is available to purchase from your local dealer.

7. SPECIFICATIONS

Inputs

Process Value Input (INP1)	
Resolution:	> 14 Bit (20.000 steps)
Decimal point:	0 to 3 digits behind the decimal point
Digital input filter:	adjustable 0.0...100.0 S
Scanning cycle:	100 ms
Measured value correction:	2-point or offset correction

Thermocouples

Input resistance:	≥1 MΩ
Effect of source resistance:	1μV/Ω

Cold-Junction Compensation

Max. additional error:	<0.5 K
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Sensor Break Monitoring

Sensor current:	≤ 1 μA
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Resistance Thermometer

Connection:	2- or 3-wire
Lead resistance:	max. 30Ω
Input circuit monitor:	Break and short circuit

Current and Voltage Signals

Span start, end of span:	anywhere within measuring range
Scaling:	selectable -1999...9999
Linearization:	16 segments, adaptable with ChromaloxPro
Decimal point:	adjustable
Input circuit monitor:	12.5% below span start (2mA, 1V)
Accuracy:	Better 0.1%

Heating Current Measurement Via Current Transformer

Measuring range:	0...30 mA AC
Scaling:	adjustable -1999..0.000..9999
Accuracy:	Better than 0.25%

Current Measuring Range

Input resistance:	ca. 120 Ω
Span:	anywhere within 0 to 20mA
Scaling:	anywhere -1999...9999
Input circuit monitor:	12.5% below span start (4...20mA → 2mA)

Control Input DI1/DI2

Configurable as direct or inverse switch or push-button!	
Connection of a potential-free contact suitable for switching "dry" circuits.	
Switched voltage:	3.3 V
Switched current:	< 10mA

Control Inputs DI3 & DI4 (option)

Configurable as direct or inverse.	
Nominal voltage:	24 V DC, external Current sink (IEC 1131 Type 1)
Logic "0":	-3...5 V
Logic "1":	15...30 V
Current requirement:	approx. 5 mA

Outputs

Relay – Option 1-3	
Contacts:	Potential free changeover
Max contact rating:	2A@ 250V 48...62Hz
Min contact rating:	6V, 1mA
Duty cycle:	I = 1A/2A 250,000/150,000 @ 250V resistive

Dual Relay – Option 2	
Contacts:	2 NO contacts with shared common
Max contact rating:	2A@ 250V 48...62Hz
Min contact rating:	6V, 1mA
Duty cycle:	I = 1A/2A 500,000/200,000 @ 250V resistive

SSR - Option 1-3	
Voltage:	10 V into 500Ω Min

Dual SSR Option 1-3	
Voltage:	10 V into 500 Ω Min

Linear DC Output Option 1 & 3 Current Output	
0/4mA...20 mA, configurable	

Signal range:	0...approx. 22 mA
Load:	≤ 500Ω
Load effect:	none
Resolution:	(0.1%)
Error:	(0.2%)

Linear DC Output Option 1 & 3 Voltage Output	
0-10 V	12.5% below span start (2mA, 1V)

Signal range:	0 to 11 V
Load:	≥ 2K Ω
Resolution:	≤ 0.1 %
Error:	≤ 0.2 %

Serial Interface

Physical:	RS485, at 1200, 2400, 4800, 9600 or 19200 bps.
Protocol:	Modbus RTU Communications

Transmitter Supply

Output:	22 mA / ≥18 V
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8. ENVIRONMENTAL

Protection Modes

Front panel:	IP 65 (NEMA 4X)
Housing:	IP 20
Terminals:	IP 20

Permissible Temperatures

For specified accuracy:	0...60°C
Warm-up time:	≥ 15 minutes
Temperature effect:	< 100ppm/K
For storage:	-20...70°C

Humidity

75% yearly average, no condensation

Electromagnetic Compatibility

Complies with EN 61 326-1 (for continuous, non-attended operation)

Symbol Explanation



Caution: general danger to life or limb