

# Process controller Setpoint programmer 1/16 DIN - 48 x 48 mm gamma**due**® series M5 line

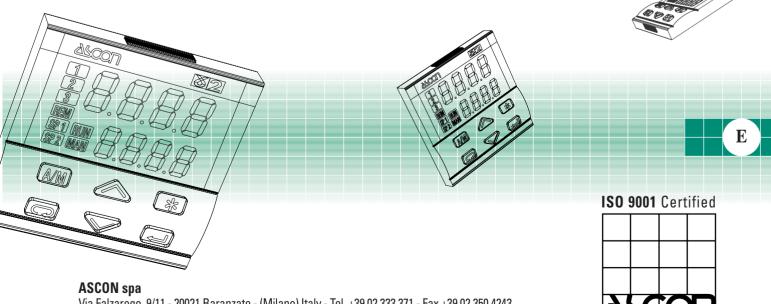
### Advanced features, customizable and process adaptable

The programmable Setpoint and the memory chip help the M5 line achieve mini process controller status.

High speed data aquisition and signal management. Efficent information transfer to the supervisor. Ability to adapt itself to changing process conditions. The most sophisticated 48 x 48 of the gamma**due®** series is user-friendly due to easy and customizable procedures. The outputs (analogue, time

proportioning or valve control) are freely addressable to the different functions like control, alarm or retransmission.



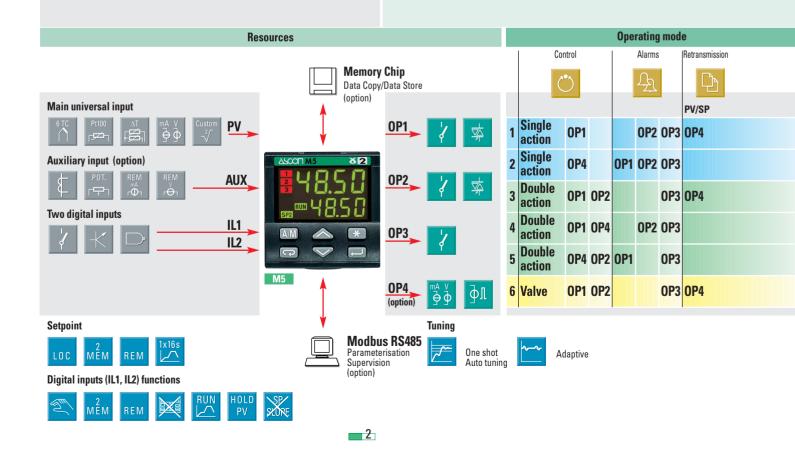


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## gammadue<sup>®</sup> the right solution to your needs



Your needs	Our solutions
High speed data acquisition and signal management	Sampling time: 100ms measure update time: 50 ms
Use of different actuators	Analogue output, heat/cool (linear, water, oil), valve control output with potentiometer position feedback
Process with time variable characteristic	Initial and automatic calculation of the right control parameters
Alarm signalling and diagnostic	4 alarms addressable to one or more outputs, latching/blocking, absolute or deviation thresholds, loop break alarm, heater break alarm by current transformer input
Interfacing with other devices	Serial communications at 19200 baud Modbus/Jbus protocol, analogue retransmission output and Remote Setpoints
Temperature profile	1 program with 16 segments, 2 stored Setpoints
Safe and reproducible configuration and parameter settings	Memory chip for data transfer and storing, configuration and parameterisation software
Quick learning	Every model has the same operating method
Ergonomic compatibility with other devices	Two colours: beige or darkgrey front panels
Environmental protection	IP65 front panel protection (indoor, dust and water protection)
Easy to use	Ergonomic keypad, clear and comprehensive display
Noise immunity	Electromagnetic compatibility
Universal input signals, linear as well as non-linear	Configurable input (TC, RTD, mA, Volt and ∆T, infrared sensor, "custom" linearisation)
Reliability and safety	CE compatibility, ASCON is ISO 9001 certified, 3 years warranty
Technical support	Technical application assistance from ASCON sales and after sales service



### **Technical data**

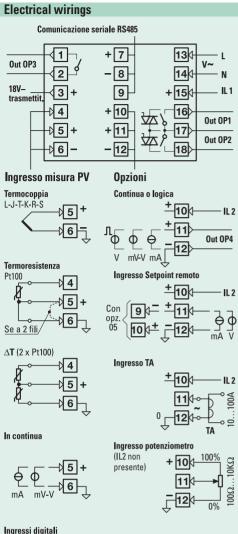
Total configurability alarm strategies operating modes     The choices are: input type, operating mode, type of control, safety strategies, alarm strategies operating       Operating modes     1 loop with single/double output     Iloop with single/double output       I loop with single/double output     1 loop as the latter with the addition of the Setpoint programmer       Proport. band (P)     0.1999.9%     User       Proport. band (P)     0.1999.9%     User       Derivative time (D)     0.1999.9%     OP or thor of the setpoint programmer       Proport. band (P)     0.150%     OP-OFF control       Derivative time (D)     0.1999.9%     OP or thor of the output addition output addition of the output addition of the output addition	Features at env. 25°C	Description					
Operating modes     1 loop with single/double output       1 loop with single/double output     1 loop as the latter with the addition of the Setpoint programmer       Algorithm     PIO with value algorithm, for controlling motorised values       Proport, band (P)     0.1999.9%       Integral line (D)     0.1999.9%       Derivative time (D)     0.1999.9%       Control mode     Cycle ime       Qrade and an esset     0.100% output       Cont Derivative time (D)     0.1999.9%       Cool Integral time     0.1999.9%       Cool Integral time     1999.9%       Cool Integral time     1999.9%       Cool Integral time     1999.9%       Cool Integral time     1		The choices are: input type, operating mode, type of control, safety strategies,					
Modes     I loop as the latter with the addition of the Setpoint programmer       Algorithm     PID with overshoot control or 0N-OFF       Proport. band (P)     0.1999 s     User       Proport. band (P)     0.1999 s     User       Derivative time (D)     0.1999 s     User     PID control       Derivative time (D)     0.1999 s     User     PID control       Control mode     Proport. band (P)     0.150%     ON-OFF control       Dead band     0.05.0%     ON-OFF control       Cool Integral time     0999 s     User       Cool Integral time     0999 s     User       Motor travel time     05.0%     Motorised valves       Feedback potent     1000210kQ     motorised valves       Feedback potent     1000210kQ     Motorised valves       Accuracy     0.25% ± 1 digits for temperature sensors     Between 10020M       Resistance     Propolog 20% cliptic remained and mV     Max wire res: 20Q       Resistance     Propolog 20% cliptic remained and mV     Between 10020M       Resistance     Propolog 25% cliptic remained and mV     Between 10020	configurability	0					
Algorithm     PID with overshoot control or 0N-OFF Proport. band (P)     PID with overshoot control in 0N-OFF       Proport. band (P)     0.19999.s     User     PID control       Manual reset     0.1.050% output     User enabl/disabled     PID control       Control mode     0.1.050% output     User enabl/disabled     P and PD control       Control mode     0.1999.9%     Time prop. control       Control mode     0.1999.9%     ON-OFF control       Dead band     0.1999.9%     ON-OFF control       Cool Droport. band     0.1999.9%     enabled/disabled       Cool Integral time     1999.9%     enabled/disabled       Cool orycle time     0.230.0     Motorrised valves       Feedback potent     100010K0     Motorised valves       Feedback potent     100010K0     Motorised valves       Accuracy     0.25% ± 1 digits for tomperature sensors     Between 100240       Not firs Ar: Ri +R2     Not firs for tomperature sensors     Between 100240       for for X: Ri +R2     C/F     2 rot swires or     Givires or       DC input (ourtent     0/420nA     Engineering units or, c							
Algorithm     PlD with value algorithm, for controlling motorised values       Proport, band (P)     1999.9%     eabled/disabled       Integratine (I)     1999.9 s     eabled/disabled       Oprivative time (D)     0.1999.9 s     eabled/disabled       Manual reset     0100% output     User enabl//disabled     P and PD control       Control mode     0.05.0%     0.0.0FF control     Time prop. control       Hysteresis     0.1999.9 s     User     Heat-Cool control       Cool Proport. band (0.1999.9 s     User     Heat-Cool control       Cool Proport. band (0.1999.9 s     User     Heat-Cool control       Cool Cocycle time     0.230.0 s     Motorisabled       Motor travel time     1.5.0%     Motorisabled       Cool Proport. band (0.1999.9 s     Update measurement time: 50 ms     Sampling time (max. update time of the output adjustable);       1100 s configurable     1100 s configurable     Max.wire res: 2002       Cormon     Characteristics     205% ± 1 digits for temperature sensors selectable     Between 100240V       Clisc Tra I+R2     PC/F     configurable/disable     0.1-27/10°C Envt. too 21°C (10°C Ta)	modes	1 loop as the latter					
PV input Integral time (I)     19999 s: Integral time (I)     View Valve algorithm, for Controlling motorized valves enabled/disabled     PID control       Control mode     Derivative time (D)     0.19999 s: Integral time (D)     View enabl/disabled     P and PD control       Control mode     Derivative time (D)     0.150%     ON-OFF control       Dead band     0050%     ON-OFF control       Cool Integral time     19999 s: Cool Ortroput. band     User enabled/disabled     P and PD control       Cool Integral time     19999 s: Cool Ortravel time     User     Heat-Cool control       Cool Dreycle time     0.230.0 s     Motor rised valves     Heat-Cool control       Cool Dreycle time     0.150%     Motor rised valves       Feedback potent     10001000     Motorised valves       Common characteristics     Sampling time (max.update time of the output adjustable): 0.110.0 s configurable - input shift: 60+60 digit input filter with enable/disable: 0.1999.9 s     Between 100240 the error is minimal thermoneter for ΔT: R1+R2 must be <320.01		Δlaorithm					
PV input (priput spatial see table 1)     Integral time (I)     19999 s 19999 s 0.19999 s 0.19999 s 0.190% ubser (0.01 control 0.050%     PID control P and PD control 0.050%       PV input (control mode     0.19990 s 0.050%     User (0.01 control mode)     0.19999 s 0.050%     0N-OFF control 0.050%       Cool Integral time (cool per, time (cool per, time (cool per, time (cool er, time)     19999 s 0.150%     User (name)     Heat-Cool control (name)       Motor travel time (cool cycle time)     0.19999 s 0.150%     Motorised valves       Feedback potent     100210k2     Motorised valves       Accuracy     0.25% ± 1 digits for temperature sensors 0.1% ± 1 digits for temperature % = selectable     Max.wire res: 1502 Sensitivity 2.20/YC Env. t. <0.1% / 20^C Interal codi junction 0.1% ± 1.0% ± 1.		-		gorithm, for controlling	motorised valves		
Derivative time (D)0.1999.9.senabled/disabledP and PD controlManual reset0100% outputUser enabl/disabledP and PD controlControl Typert band0.150%ON-OFF controlDead band0.050%ON-OFF controlCool Integral time1999.9 sUserCool Integral time1999.9 sUserCool Integral time1999.9 sUserMotor travel time0.1999.9 sUserMotor travel time0.1999.9 sUserMotor travel time0.1999.9 sUserMotor travel time0.1999.9 sUserMotor travel time0.190%Motories 0 and sMotor travel time0.190%Motories 0 and sCommoncharacteristics0.110.2 configurable - Input shift: 50+ 60 digitCommoncharacteristics0.110.2 configurable - Input shift: 50+ 60 digitNatific travel time110.2 configurable - Input shift: 50+ 60 digitInput filter with enable/disable: 0.199.9 sSAccuracy0.25% ± 1 digits for tramperature sensorsResistancethermometerthermoneterft00210K2ThermocoupleUL_TK.R.2Di input (voltage)050.WDi cinput (voltage)050.WDi cinput (voltage)050.WDi cinput (voltage)050.WDi cinput (voltage)050.MDi cinput (voltage)050.MDi cinput (voltage)050.MDi cinput (voltage)050		· · ·					
Manual reset0100% outputUser enabl/disabledP and PD controlControl mode $V_{C}$ (c time0230.0 sTime prop. controlHysteresis0.15.0%ON-OFF controlDead band0.05.0%Col Integral time1399.9.%Cool Der, time0.15.0%Heat-Cool controlCool Der, time0.15.0%Motor travel time1999.9.sMotor travel time15600 sMotorised valvesFeedback potent100210kQMotorised valvesAccuracy0.230.0 sMotorised valvesCommoncharacteristicsSampling time (max.update time of the output adjustable): 0.1999.9 sBetween 100240Accuracy0.25% ± 1 digits for temperature sensors selectableBetween 100240Accuracy0.25% ± 1 digits for mA and mV)the error is minimal must be <320Q)					PID control		
Cycle time     0.230.0 s     Time prop. control       Control mode     Hysteresis     0.15.0%     0N-OFF control       Cool Proport. band     0.1999.9 s     User     0N-OFF control       Cool Der. time     0.1999.9 s     user     enabled/disabled       Cool Der. time     0.1999.9 s     user     enabled/disabled       Cool Cocycle time     0.230.0 s     Mator travel time     for travel time       Motor travel time     15600 s     Matorised valves       Feedback potent     700 converter with resolution of 160.000 points     Update measurement time: 50 ms       Sampling time (max. update time of the output adjustable):     0.1999.9 s     Between 100240v       Accuracy     0.25% ± 1 digits for temperature sensors     Between 100240v     the error is minimal       ranges     Resistance     file on C     100 configuration co		Derivative time (D)					
Control mode     Hysteresis Dead band     0.15.0%     ON-OFF control       Cool Proport. band     0.1999.9%     Heat-Cool control       Cool Inergral time     0.1999.9%     User       Cool Inergral time     0.1999.9%     Heat-Cool control       Cool Inergral time     0.1999.9%     Heat-Cool control       Motor travel time     1560%     Motorised valves       Feedback potent.     100210k2     Motorised valves       Accuracy     0.25% ± 1 digits for temperature sensors     Between 1002400       Common characteristics     Common characteristics     Differ Thermoscouple     Max wire res: 1002       Accuracy     0.25% ± 1 digits for temperature sensors     Between 1002400     Heaven 1002400       (for λΓ. H+R2 must be <320Ω)				User enabl./disabled	P and PD control		
Control mode     Dead band     0.05.0%       Cool Proport. band     0.1999.9%     User       Cool Der, time     0.1999.9     enabled/disabled       Cool Cycle time     0.230.0     mathematical states of the sta							
Decision of the constraint of t	Control mode		0.15.0%		ON-OFF control		
$ \begin{tabular}{ c c c c c c c } \hline \hline Cool Integral time & 1999 s & User \\ \hline Cool Der. time & 0.1999 s & enabled/disabled \\ \hline Cool cycle time & 0.230. s & & & & & & & & & & & & & & & & & & $	oonaonnoao						
Cool Der. time     0.1999.9 s     enabled/disabled       Cool cycle time     0.230.0 s     Motor rimin step     Motor step     Motor rimin st							
Cool cycle time     0.230.0 s       Motor travel time     15600 s       Motor minim. step     0.15.0%       Motor minim. step     0.15.0%       Motor minim. step     0.15.0%       Vingut     Feedback potent.       Optimum     ACD converter with resolution of 160.000 points       Update measurement time: 50 ms     Sampling time (max. update time of the output adjustable):       Common characteristics     O.25% ± 1 digits for temperature sensors       Accuracy     0.25% ± 1 digits (for mA and mV)       Resistance thermometer     Pt1002 a 0°C       f(or ΔT. R1+R2 must be <320Ω)		-			Heat-Cool control		
Motor travel time Motor minim. step     15600 s 0.15.0%     Motorised values       Feedback potent.     100210kΩ     Motorised values       Accuracy     A/D converter with resolution of 160.000 points Update measurement time: 50 ms Sampling time (max. update time of the output adjustable): 0.110.0 s configurable - Input shift: 604 60 digit Input filter with enable/disable: 0.1999.9 s       Accuracy     0.25% ± 1 digits for temperature sensors 0.1% ± 1 digits for temperature sensors 0.1% ± 1 digits for temperature sensors selectable     Between 100240 Max. wire res: 20Ω (3 wires)       Resistance thermoneter (for ΔT H+R2 ranges see table 1)     Pt100Ω a 0°C (IEC 751)     2 or 3 wires or 2 Pt100 for ΔT     Max. wire res: 150Ω Sensitivity -Q/PF       DC input (current)     0/420mA Rj = 30Ω     Internal cold junction compensation     Max. wire res: 150Ω Sensitivity -Q1/02 Wire res       DC input (voltage)     050 mV Rj = 10MΩ     Engineering units Decimal point conf. with or without √ Rj = 30Ω     Input drift: -0.1% / 20°C       Auxiliary inputs (options)     Remote Setpoint Not isolated accuracy 0.1%     Current Not isolated accuracy 0.1%     Current Ratio from -9.9.9+99.99     Input drift: -0.1% / 20°C       CT current transformer     To Current Not solated accuracy 0.1%     Ratio from -9.9.9+99.99     Input drift: -0.1% / 20°C       CT current transformer     100Ω1KΩ sop10Ω		Cool Der. time			-		
Motor minim. step     0.15.0%     Motorised valves       Feedback potent.     100Ω10kΩ     AD converter with resolution of 160.000 points Update measurement time: 50 ms Sampling time (max. update time of the output adjustable): 0.110.0 s configurable - Input shift: 60+ 60 digit Input filter with enable/disable: 0.1999.9 s       Accuracy     0.25% ± 1 digits for temperature sensors thermometer (for signal ranges see table 1)     Between 100240V D.1% ± 1 digits for mA and mV)     Max. wire res: 20Ω (3 wires)       Thermocouple     VC/°F vselectable     2 or 3 wires or 2 Pt100 for ΔT     0.1°C/10°C Env. t. <0.1°C/10°C Env. t. <0.1°C/10°C Wire res		,					
Feedback potent.     100Ω10kΩ       Accuracy     A/D converter with resolution of 160.000 points Update measurement time: 50 ms Sampling time (max. update time of the output adjustable): 0.110.0 s configurable - Input shift: 60+ 60 digit Input filter with enable/disable: 0.1999.9 s       Accuracy     0.25% ± 1 digits for temperature sensors thermometer (for AI: R1-R2 must be <3202Ω)		Motor travel time					
PV input (for signal ranges see table 1)     Common characteristics     A/D converter with resolution of 160.000 points Update measurement time: 50 ms Sampling time (max.update time of the output adjustable): 0.110.0 s configurable - Input shift: 60+ 60 digit Input fitter with enable/disable: 0.1999 s       Accuracy     0.25% ± 1 digits for temperature sensors 0.1% ± 1 digits (for mA and mV)     Between 100240V the error is minimal digits (for mA and mV)       Resistance for AT: R1+R2 must be <320Ω		Motor minim. step	0.15.0%	Motorised valves			
PV input (for signal ranges see table 1)Common characteristicsUpdate measurement time: 50 ms Sampling time (max. update time of the output adjustable): 0.110.0 s configurable - Input shift : 60+ 60 digit Input filter with enable/disable: 0.1999.9 sAccuracy0.25% ± 1 digits for temperature sensors 0.1% ± 1 digits (for mA and mV)Between 100240v the error is minimal measurementResistance thermometer (for Signal ranges see table 1)Pt100Ω a 0°C (IEC 751) °C/°F selectable2 or 3 wires or 2 Pt100 for ΔTMax. wire res: 2 0.1°C/10Ω Wire res (J0°C Env. t. c.01°C/10Ω Wire res: 150Ω Sensitivity <2µU/°C Env. t. <5µV/10Ω Wire res		Feedback potent.	100Ω10kΩ				
PV input (for signal ranges see table 1)Accuracy $0.1\% \pm 1$ digits (for mA and mV)the error is minimal the error is minimal Max. wire res: 2002 (3 wires) 2 or 3 wires or 2 Pt100 for $\Delta T$ Max. wire res: 2002 (3 wires) 0.1 °C/10°C Env. t. $< 0.1°C/10°C Env. t.$ $< 0.1°C/10°C Env. t.< 0.1°C/10°C Vire resEngineering unitsDecimal point conf.with or without \sqrt{10000} Wire res< 0.1°C/10°C Vire res$			Update measure Sampling time (n 0.110.0 s confi	output adjustable): )+ 60 digit			
PV input (for signal ranges see table 1)thermometer (for ΔT: R1+R2 must be <320Ω)(IEC 751) °C/°F selectable2 or 3 wires or 2 Pt100 for ΔT(3 wires) (3 wires)(3 wires) (3 wires)(3 wires) (3 wires)ThermocoupleL,J,T,K,R,S (IEC 584) °C/°F selectableInternal cold junction compensationMax. wire res: 150Ω Sensitivity <2µV/°C Env. t. <5µV/10Ω Wire res		Accuracy		Between 100240V~ the error is minimal			
see table 1)ThermocoupleL,J,T,K,R,S (IEC 584) °C/°F selectableInternal cold junction compensationMax. wire res: 1502 Sensitivity $<2\mu//°C Env. t.<5\mu//10\Omega Wire resDC input (current)0/420mAR_j = 30\OmegaEngineering unitsDecimal point conf.with or without Initial Sc: -9999999full Sc: -999+99.99fucal + Remote SetpointAuxiliary inputs(options)CT currenttransformerSupply SourchSourchSourchSupply. 300mVBias in engineering units and \pm rangeresolution of 1A with alarm threshold(Heater break alarm)Digital inputs2 logic1000210K\Omegasupply. 300mVPosition feedbackmeasurementDigital inputs2 logicThe closure ofthe externalcontactproduces anyof th$	(for signal ranges	thermometer (for $\Delta T$ : R1+R2	(IEC 751) °C/°F				
$ \frac{DC \text{ input (current)}}{DC \text{ input (voltage)}} = 30\Omega \\ R_j = 30\Omega \\ \hline R_j = 30\Omega \\ \hline DC \text{ input (voltage)} = 10M\Omega \\ \hline \OmegaC \text{ input (voltage)} = 10M\Omega \\ \hline R_j = 10K\Omega \\ \hline R_j = 30\Omega \\ \hline Voltage \\ 15/05/010V \\ R_j = 300K\Omega \\ \hline Voltage \\ 15/05/010V \\ R_j = 300K\Omega \\ \hline CT current \\ transformer \\ \hline CT current \\ transformer \\ \hline CT current \\ transformer \\ \hline R_j = 30\Omega \\ \hline Not isolated \\ accuracy 0.1\% \\ \hline R_j = 300K\Omega \\ \hline Not isolated \\ accuracy 0.1\% \\ \hline R_j = 300C \\ \hline Not isolated \\ accuracy 0.1\% \\ \hline R_j = 300C \\ \hline Not isolated \\ accuracy 0.1\% \\ \hline Potentiometer \\ \hline Potentiometer \\ \hline Digital inputs \\ \hline 2 \text{ logic } \\ \hline R_j = 30\Omega \\ \hline The closure of \\ the external \\ contact \\ produces any \\ of the following \\ actions \\ \hline M_j = Contact \\ produces any \\ \hline Start, stop, hold of a program \\ (only with Setpoint programmer) \\ \hline R_j = 30\Omega \\ \hline R_j = 300K\Omega \\ \hline R_j =$		Thermocouple	(IEC 584) °C/°F		150 $\Omega$ Sensitivity		
$ \begin{array}{c} \label{eq:constraint} \begin{tabular}{ c c c c c } \hline \end{tabular} \\ \hline $		DC input (current)	-, -		Input drift <sup>,</sup>		
$ \begin{array}{l} \mbox{Auxiliary inputs} \\ \mbox{(options)} \end{array} \begin{array}{l} \mbox{Remote Setpoint} \\ \mbox{Not isolated} \\ \mbox{accuracy 0.1\%} \end{array} \begin{array}{l} \mbox{Not isolated} \\ \mbox{Voltage} \\ \mbox{15/05/010V} \\ \mbox{Rj = 300K\Omega} \end{array} \end{array} \begin{array}{l} \mbox{Ratio from -9.99+99.99} \\ \mbox{Local + Remote Setpoint} \end{array} \end{array} \end{array}$		DC input (voltage)	Rj = 10MΩ 15/05/010V	with or without √ Initial Sc.: -9999999 Full Sc.: -9999999	<0.1% / 20°C Env. temperature <5μ/10Ω Wire res.		
Auxiliary inputs (options)   accuracy 0.1%   Voltage 15/ 05/ 010V Rj = 300KΩ   Ratio from -9.99+99.99     Local + Remote Setpoint   Local + Remote Setpoint   Local + Remote Setpoint     CT current transformer   max. span 50 or 100 mA hdw selectable   Display from 10 to 200 A resolution of 1A with alarm threshold (Heater break alarm)     Potentiometer   100Ω10KΩ supply. 300mV   Position feedback measurement     Digital inputs   2 logic   The closure of the external contact produces any of the following actions   Auto/Man mode change, Local/Remote Setpoints activation, keypad lock, measure hold and slopes inhibit.			0/420mA	Bias in engineering ur	nits and ± range		
Auxiliary inputs (options) Rj = 300KΩ Local + Remote Setpoint   CT current transformer max. span 50 or 100 mA hdw selectable Display from 10 to 200 A resolution of 1A with alarm threshold (Heater break alarm)   Potentiometer 100Ω10KΩ supply. 300mV Position feedback measurement   Digital inputs 2 logic The closure of the external contact produces any of the following actions Auto/Man mode change, Local/Remote Setpoint mode change, Stored Setpoints activation, keypad lock, measure hold and slopes inhibit.				Ratio from -9.99+99.99			
CT current transformer   max. span 50 or 100 mA hdw selectable   Display from 10 to 200 A resolution of 1A with alarm threshold (Heater break alarm)     Potentiometer   100Ω10KΩ supply. 300mV   Position feedback measurement     Digital inputs   2 logic   The closure of the external contact produces any of the following actions   Auto/Man mode change, Local/Remote Setpoints activation, keypad lock, measure hold and slopes inhibit.							
Potentiometer     supply. 300mV     measurement       Digital inputs     2 logic     The closure of the external contact produces any of the following actions     Auto/Man mode change, Local/Remote Setpoints activation, keypad lock, measure hold and slopes inhibit.	(5,2,0,0)		50 or 100 mA	resolution of 1A with a			
Digital inputs   2 logic   The closure of the external contact produces any of the following actions   Auto/Man mode change, Local/Remote Setpoint mode change, Stored Setpoints activation, keypad lock, measure hold and slopes inhibit.		Potentiometer					
(only with Setpont programmer)	Digital inputs	2 logic	The closure of the external contact produces any of the following	Auto/Man mode change, Local/Remote Setpoint mode change, Stored Setpoints activation, keypad lock, measure hold and slopes inhibit. Start, stop, hold of a program			
Single or double channel, direct or reverse ection		Single or double ab			ogrammel <i>j</i>		
	Control output	Single or double channel, direct or reverse action					
(analogue) Minimum limit 0100.0% (UP1 heat) Maximum limit 0100.0% (OP1 heat), -100.00% (OP2 cool)		Minimum limit     0100.0% (OP1 heat)       Maximum limit     0100.0% (OP1 heat)					

In most to us a	0			
Input type	Scale range			
	-200600 °C			
RTD	-3281112 °F			
Pt100 $\Omega$ at 0°C	-99.9300.0 °C			
	-99.9572.0 °F			
RTD	-50.050.0 °C			
$2xPt100\Omega$ at 0°C for $\Delta T$	-58.0122.0 °F			
T/C type L	0600 °C			
Fe-Const.	321112 °F			
T/C type J	0600 °C			
Fe-Cu 45% Ni	321112 °F			
T/C type T	-200400 °C			
Cu - CuNi	-328752 °F			
T/C type K	01200 °C			
Cromel Alumel	322192 °F			
T/C type R	01600 °C			
Pt13%Rh-Pt	322912 °F			
T/C type S	01600 °C			
Pt10%Rh-Pt	322912 °F			
0/420 mA, 050 mV	Configurable engineering units			
0/15 V, 010 V	mA, mV, V, bar, psi, Rh, ph			
mV Custom scale	On request			

Table 1 : PV input

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Features at env. 25°C	Description						
	Max. slope	0.0199.9	9%/s up and	down			
	Safety value	-100100	00%. User enabled/disabled				
			2 Relays SPST NO, 2A/250Vac resistive loads (4A/120Vac)				
	Time	2 Triacs	cs 1A/250Vac resistive loads				
Control output	proportioning	SSR drive			Galvanic isolation 500Vac/1min		
	Anglanus	Current	0/420mA max. 750Ω/10Vmax. 12 bit (0.025%)				
	Analogue (optional)	Voltage	01/5/10V 500Ω/20mA max.		Accuracy 0.1% Short circuit protection		
	Motorised valve (3 states) Raise - Stop - Lower 2 poles NO, 2A/250Vac resistive load						
	SPST NO, 2A/250	Vac resistive	load - hyster	resis 0.15.0% sym	metrical		
		Active high		Deviation threshol	d ± range		
		Active mgi	ACUUIT	Band threshold	0range		
A I		Active low	type	Absolute threshold	-		
Alarms	Action		Heater B	reak detection			
	Action		Loop Bre				
		Special functions		n inhibit (blocking)			
		IUNCTIONS		edge (latching)			
				o the program (opti	onal) (OP3)		
Analogue	Galvanic isolation		Current: 0	)/420mA			
output OP4	Resolution: 12 bit	t (0.025%)	750Ω/10V		Retransmission		
(optional)	Accuracy: 0.1%	tactad		I5/05/010V	of PV or SP		
	Short circuit protected Ramp up and down, with		500Ω/20mA max. Local plus 2 stored Setpoints				
	slope in digit/s, d		Only Rem				
Cotnoint	or digit/hour between 0.010.0% of the range		Local and Remote				
Setpoint			Local with trim				
			Remote v	vith trim			
	High and low lim			grammable (optiona	al)		
Programmable	1 program, 16 segments (1initial and 1 end)						
Setpoint	From 1 to 9999 cycles or continuous cycling (OFF) Time values in seconds, minutes and hours						
(optional)					t and serial comm.s		
			ep response method for calculating the PID terms parameters				
Tuning							
Tuning	Adaptive tune self-learnig, not intrusive, analysis of the process response to						
	disturbances and continuous calculation of the PID parameters (not available with the Setpoint Programmer option)						
Auto/Manual		controller, bumpless					
station		controller, bumpless ypad, digital inputs and serial communications					
Serial comm.s	RS 485 isolated,						
(optional)	1,200, 2,400, 4,80			ires			
Auxil. supply	18Vdc ±20%, 30n						
	Measure			e, short circuit or se			
	input Control output				and alerts on display		
	Control output			00%, (user enabled,			
Operational				juration data are st ed time. They are or	ored in a non volatile		
safety	Parameters				ible and changeable,		
				able, not visible	isis ana changeable,		
	Access				ta and the parameter		
	protection	protection					
	Power supply	100240Va	c (-15+10%		:(-25+12%), 50/60Hz		
				. Power consumpti			
	Safety				s 2 (2,5kV), poll. class II		
	Electromagnetic			standards for indus	trial system and		
General	compatibility UL and cUL	equipment					
characteristics	Approval	File E17645	2				
	Protection EN60529 (IEC 529)	IP65 front panel					
	Dimensions	<sup>1</sup> / <sub>16</sub> DIN - 4	8 x 48, depth	150 mm, weight 23	0 g approx.		



Ingressi digitali

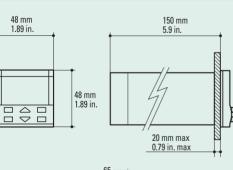
Dimensions

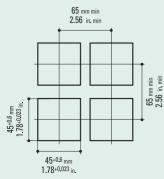
18V-

Pt100

Ø







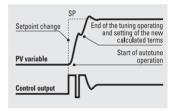
#### Tuning

Two methods of tuning are available:

- Auto-Tuning "one shot"
- Adaptive-Tuning
- continuous and self-teaching

The **Auto-Tuning** method works best on the step response basis. When activated it modifies the output value and, in a short time, calculates the PID parameters. The new algorithm is operational immediately.

The main advantages of this method are fast calculation and quick implementation.



The ASCON self teaching **Adaptive-Tuning** waits for process change to recalculate the new PID parameters. The new PID calculation does not influence the control output, avoiding any disturbance. The PID optimisation is done only when necessary (e.g. Setpoint changes or process disturbances like load changes).

No action by the operator is required.

The operating mode of Adaptive-Tuning is safe and user friendly. It tests the process response after a disturbance, it memorises the intensity and frequency of the reaction, then the Adaptive-Tuning checks the new information with its statistical data base.

The correct PID algorithm is then ready to implement. This tuning is ideal for non-linear

processes where the PID parameters must be adapted to changing conditions.



#### If the Adaptive-Tuning is not requested, the controller can be fitted with a Setpoint programmer option. A profile of up to 16 segments can be programmed. Number of cycles as well as the max. allowed deviation can be configured. The time base can be selected from seconds, minutes and hours. Run, Hold and Stop functions can be performed by means the front keypad or by external commands.

Memory chip

The memory chip makes

possible a fast and safe transfer of data related

With a simple operation,

the information can be stored

and copied to the memory chip.

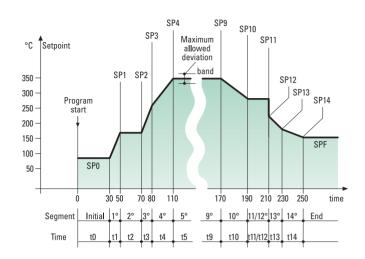
The procedure can be protected

to the configuration

and all parameters.

by a password.

#### **Setpoint programmer**



#### Integrity in data copy



#### **Configuration software**

A software tool is available to improve both the configuration and the parameterization. All the data can be stored to file. It is also possible to down-load the linearisation of the "custom" input by using the polynomial's coefficients.

#### Fast view - fast parameter access

The **Fast view** is a password protected review procedure of the 10 most useful parameters. The combination of a luminous and comprehensive display and the ergonomic keypad allows the **immediate access** to the **Fast View**.





Ordering codes	Line	Basio	c mode	el		Acc	essori	es
Model:	M5	A B	C	D	-	E F	G	0
Power supply			•	•	•		Ī	
Outputs								
Serial comm.s/Options								
Setpoint								
Instr. handbook								
Colour								

100240Vac (-15+10%)	3
24Vac (-25+12%) or 24Vdc (-15+25%)	5

Outputs OP1 (OP2)	В
Relay-Relay	1
Relay-Triac	2
Triac-Relay	4
Triac-Triac	5

Serial comm.s	Options		C	D
	None [2]		0	0
	Auxiliary	Feedback potentiometer [2]	0	1
Not fitted		Remote Setpoint [1]	0	2
Not niteu	input	Current transformer	0	3
	Auxiliary	SSR drive/Analogue	0	4
	output	SSR drive/Analogue + Remote Setpoint [1] [2]	0	5
	None [2]		5	0
RS 485	Auxiliary	Feedback potentiometer [2]	5	1
Modbus/Jbus protocol	input	Remote Setpoint [1]	5	2
		Current Transformer	5	3
	SSR drive/Ana	alogue auxiliary output	5	4

Setpoint Programmer	E
Not fitted	0
Fitted (adaptive-tuning not available)	1
Instruction handbook	F
Italian-English (std)	0
French-English	1
German-English	2
Spanish-English	3
Front case colour	G
Dark (std)	0
Beige	1

[1] Not available with Setpoint programmer installed (E=1)
[2] Second digital input (IL2) not available

# If not differently specified the controller will be supplied with standard version Model: M5 3100-0000

