



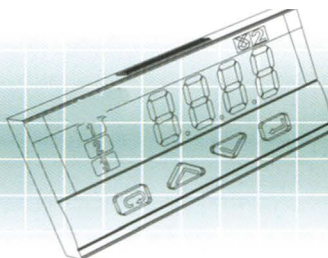
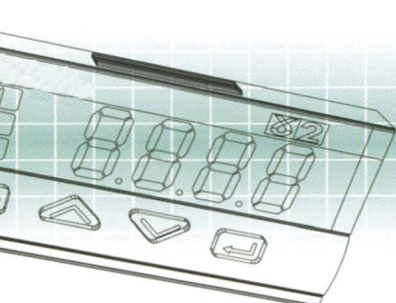
Gamma2 Series C1

Controller Indicator Transmitter

1/32 DIN - 48 x 24 mm



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HC.02.17.C1/E

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gamma2®

Restricted rooms and reduction of the instrumentation overall dimensions

1/32 DIN - 48 x 24 Size

Easy replacing and fast start-up

Configuration by codes

Correct tuning at any condition

Automatic selection between two different methods

Conversion and retransmission of low level signals

Transmitter with isolated and continuous output

Contactless temperature measures

Indicator with infrared input ability

Alarm signalling

Absolute and deviation alarms

Interfacing with other devices

Serial communications at 9600 baud Modbus/Jbus protocol, continuous retransmission output

Quick learning

Every model have the same operating mode

Chromatic compatibility with other devices

Two colours: a light one and a dark one

Need to wash up working environment

IP65 front panel protection

Easy to use

Ergonomic keyboard, clear and complete display

Installation in environment with electromagnetic disturbances

Electromagnetic compatibility higher then the requested one by the specifications

Various input signals, linear and not linear

Configurable input (TC, TR, mA, Volt and ΔT , infrared sensor, custom linearisation)

Reliability and safety warranty

CE compatibility, ISO 9001 certified, 3 years warranty

Technical support

Technical background and availability of sales and after sales service

Resources

Main universal input



C1



Setpoint



Modbus RS485
Parameterisation
Supervision

Fuzzy tuning with automatic selection



One shot
Auto tuning



One shot
Natural Frequency

Operating mode

	Control	Alarms	Retransmission
			PV
0 Indication only		OP1 OP2	OP4
1 Single action	OP1		OP4
2 Single action	OP2	OP1	OP4

Technical data

Features at env. 25°C	Description				
Total configurability	From keyboard or serial communications, the user selects:		- the type of input - the associated functions and the corresponding outputs - the type of control algorithm - the type of output and the safe conditions - the type and functionality of the alarms - the values of all the control parameters		
	Common characteristics	A/D converter with 50.000 points Update measurement time : 0.2 sec Sampling time : 0.5 sec Input shift : ± 60 digits Input filter : 1...30 sec (OFF= 0)			
		Accuracy	0.25% ± 1 digit (T/C and RTD) 0.1% ± 1 digit (mA and mV)		
	PV input (for signal ranges see table 1)	Resistance thermometer	Pt100Ω at 0°C (IEC 751) °C /°F selectable	2 or 3 wire connection	Line: 20Ω max (3 wire) Thermal drift 0.1°C/10°C env. T. <0.1°C/10Ω line resist.
Thermocouple			L,J,T,K,S (IEC 548) °C /°F selectable		Internal cold junction compensation
DC input (current)		0/4...20mA with 2.5Ω ext. Shunt Rj > 10MΩ	Engineering units, floating decimal point, Low Range -999...9999	Input drift: < 0.1%/20°C env. T.	
DC input (voltage)		0/10...50mV Rj >10MΩ	High Range -999...9999 100 digits minimum		
Operating modes	Indicator with 2 alarms		AL1 alarm	AL2 alarm	
			OP1 - relay or triac	OP2 - logic	
	1 PID loop or ON/OFF with 1 alarm		OP2 - logic	OP1 - relay or triac	
			Control output	AL2 alarm	
Control mode	Algorithm		OP1 - relay or triac	OP2 - logic	
			OP2 - logic	OP1 - relay or triac	
	Proport. band (P)		0.5...999.9%		
	Integral time (I)	OFF = 0	P.I.D. algorithm		
	Derivative time (D)				0.01...10.00 min.
	Cycle time	1...200 sec.s			
	Overshoot control	0.01...1.00			
High limit	100.0...10.0%				
Hysteresis	0.1...10.0%	ON/OFF algorithm			
OP1 output	SPST relay N.O., 2A/250V(for resistive load)				
OP2 output	Triac, 2A/250V~ for contactor coil				
AL1 alarm	Logic not isolated: 5V~, ± 10%, 30mA max				
AL1 alarm (indicator with 2 alarms)	Hysteresis 0.1...10.0% range				
	Active high	Absolute threshold, whole range			
	Active low				
AL2 alarm	Hysteresis 0.1...10.0% range				
	Action	Active high	Action type	Deviation threshold ± range	
		Active low		Band threshold 0...range	
		Special function	Sensor break		
Setpoint	Up and down ramps		0.1...999.9 digit/min (OFF = 0)		
	Low limit		from low range to high limit		
	High limit		from low limit to high range		
OP4 (option)	Galvanically isolated: 500V~/1min		Current output: 0/4...20mA 750Ω/15V max		
PV retransmission output	Resolution: 12bit (0.025%)				
One-shot	Accuracy: 0.1%				
Fuzzy-Tuning	Depending the process condition, the controller applies the best method		Step response		
Ser. com.s (opt.)			Natural frequency		
Aux. p. supply	RS 485 isolated, Modbus/Jbus protocol 1200, 2400, 4800, 9600 bit/sec, two wires				
	+18V~ ±20%, 30mA max for external transmitter supply				

Input type	Scale range	
RTD Pt100 Ω at 0°C	-99.9...300.0	°C
	-99.9...572.0	°F
	-200...600	°C
	-328...1112	°F
T/C type L	0...600	°C
Fe-Const.	32...1112	°F
T/C type J	0...600	°C
Fe-Cu 45% Ni	32...1112	°F
T/C type T	-200...400	°C
Cu - CuNi	-328...752	°F
T/C type K	0...1200	°C
Cromel Alumel	32...2192	°F
T/C type S	0...1600	°C
Pt10%Rh-Pt	32...2912	°F
0/4...20 mA	Configurable engineering units mA, mV, V, bar, psi, Rh, ph	
0/10...50 mV		
mV Custom scale	On request	

Table 1 : PV input

Fuzzy Tuning

Two methods of tuning are available:

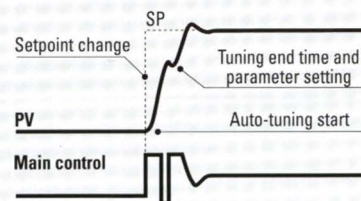
- **Auto-Tuning "one shot"**
- **Natural frequency "one shot"**

The **Fuzzy-Tuning** automatically selects one of the two methods which assure the best result for each condition.

The **Auto-Tuning** works on the step response method basis.

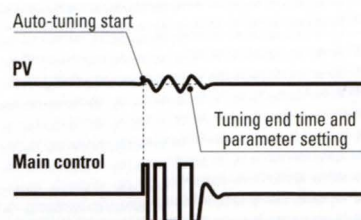
When launched, if exist a deviation between Setpoint and process variable larger than 5% of scale range, the controller modifies the output value. Then it calculates the PID parameters in a short time. The new algorithm it is immediately operating.

The main advantages of this method are fast calculation and easy launching.



The **Natural frequency** method works when the process variable is very near to the Setpoint. When launched it causes the process oscillation around the Setpoint value.

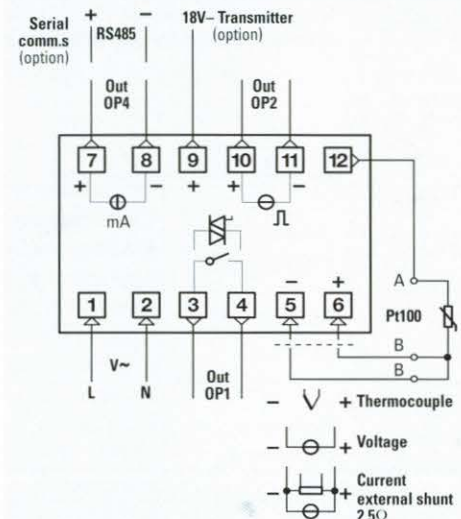
The main advantage of this method is the accurate calculation of the algorithm.



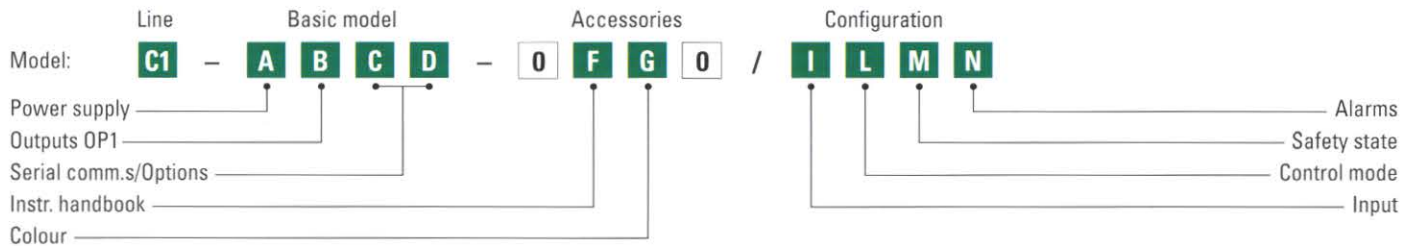
Technical data

Features at env. 25°C	Description
Operational safety	Measure input Detection of out of range, short circuit or sensor break with automatic activation of the safety strategies and alerts on display
	Control output Safety value: 0...100%. (user enabled/disabled)
	Parameters A non volatile memory stores for unlimited time all the parameter values
	Password A password protects the access to the instrument configuration
	Power supply 85...264V~ -48...63 Hz or 18...28V~, 48...63Hz and 20...30V~ Power consumption 3VA max
General characteristics	Electrical safety Compliance EN61010, installation class 2 (2500V), pollution class 2
	Electromagnetic compatibility Compliance to the CE standards for industrial system and equipment
	Protection EN60529 IP20 termination unit, IP65 front panel
	Overall dimensions $\frac{1}{32}$ DIN - 48 x 24, depth 120 mm, weight 100g appr. Panel cut-out: $45^{+0.6}_{-0.3} \times 22.2^{+0.3}_{-0.3}$ mm

Electrical wiring



Ordering codes



Power supply	A
85...264 V~ 48/63 Hz	3
18...28 V~ 48/63 Hz or 20...30 V~	5

OP1 output	B
Relay	0
Triac	3

Serial communicat.	Options	C	D
Not fitted	None	0	0
	Transmitter power supply	0	6
	Transmitter power supply + Retransmission	0	7
Rs485 Modbus/JBus protocol	None	5	0
	Transmitter power supply	5	6

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

Input type	Range scale	I
TR Pt100 IEC751	-99.9...300.0 °C -99.9...572.0 °F	0
TR Pt100 IEC751	-200...600 °C -328...1112 °F	1
TC L Fe-Const DIN43710	0...600 °C 32...1112 °F	2
TC J Fe-Cu45% Ni IEC584	0...600 °C 32...1112 °F	3
TC T Cu-CuNi	-200...400 °C -328...752 °F	4
TC K Chromel -Alumel IEC584	0...1200 °C 32...2192 °F	5
TC S Pt10%Rh-Pt IEC584	0...1600 °C 32...2912 °F	6
0...50mV linear	Engineering units	7
10...50mV linear	Serial communications	8
mV "Custom" scale	On request	9

Output configuration	L
P.I.D.	control OP1 / alarm AL2 on OP2
	control OP2 / alarm AL2 on OP1
On - Off	control OP1 / alarm AL2 on OP2
	control OP2 / alarm AL2 on OP1
Indicator	alarm AL1 on OP1 / alarm AL2 on OP2
with 2 alarms	alarm AL1 on OP2 / alarm AL2 on OP1

Type of control	Safety	M
Reverse (AL1 active low)	0%	0
Direct (AL1 active high)	0%	1
Reverse (AL1 active low)	100%	2
Direct (AL1 active high)	100%	3

AL2 type and function	N
Disabled	0
Sensor break	1
Absolute	active high
	active low
Deviation	active high
	active low
Band	active out
	active in

If not differently specified the controller will be supplied with standard version

Model: C1-3000-0000/0000