Platinum™
SERIES
athenacontrols.com

Limit Controller

1/16 DIN - 48 x 48 mm

Platinum™ series M400 line

FM APPROVED
CE
c UL us

Safe, easy and flexible

The 1/16 DIN micro-processor based M400 Platinum Limit Controller is used in thermal applications to safely limit temperature where a runaway condition may compromise operator safety, equipment, or product. The M400 Limit Controller provides this protection while also offering standard features of a second relay alarm output, IP65 front panel protection and Factory Mutual (FM) approval. Options include a digital input (for remote reset), Modbus communications, DIN rail-mounting, and two front panel colors.

Ordering Codes

Line | Basic model | Accessories

Model: **M400** **A** **B** **C** **D** – **E** **F** **G** **H** Model Example: M400-3190-9300

- A: Power supply
- B: Outputs
- C: Option 1
- D: Option 2
- E: Special functions
- F: User Manual
- G: Color
- H: Mounting

Power supply		**A**	
100-240V~ (-15% + 10%)		3	
24V~ (-25% + 12%) or 24V– (-15% + 25%)		5	
Output OP1	**Output OP2***	**B**	
Relay	Logic or Relay	1	
Option 1	**Option 2**	**C**	**D**
None	None	0	0
RS 485; Modbus/Jbus	None	5	0
Digital input	None	9	0
Special functions		**E**	
Limit model - FM approval		9	
Instruction handbook		**F**	
English		3	
Front bezel color	**0/4-20 mA input shunt resistor****	**G**	
Dark grey (std)	Standard resistor	0	
Beige	Standard resistor	1	
Dark grey	High accuracy resistor	2	
Beige	High accuracy resistor	3	
Mounting		**H**	
Panel (std)		0	
Din rail with display		1	

Input type	**Range scale**		
RTD Pt100 IEC751	-99.9…300.0	°C	-99.9…572.0 °F
RTD Pt100 IEC751	-200…600	°C	-328…1112 °F
TC L Fe-Const DIN43710	0…600	°C	32…1112 °F
TC J Fe-Cu45% Ni IEC584	0…600	°C	32…1112 °F
TC T Cu-CuNi	-200 …400	°C	-328…752 °F
TC K Cromel -Alumel IEC584	0…1200	°C	32…2192 °F
TC S Pt10%Rh-Pt IEC584	0…1600	°C	32…2912 °F
0…50mV linear (0...20mA)	Engineering units		
10…50mV linear (4...20mA)	Engineering units		
Custom input	By request		
Operator mode display			
Input variable			
AL1 threshold			
AL2 threshold			
Alarm 1 power-on condition	**AL1 function**		
Automatic Reset	High limit		
Manual Reset	Low limit		
Status Retention			
AL2 type and function		**AL2 action**	**AL2 reset**
Disabled		Direct	Auto
Sensor break		Reverse	Manual
Absolute	active high active low		
Deviation	active high active low		
Band	active out active in		

* *OP2 field configurable via hardware jumper*

** *Std. shunt resistor without field calibration = 1.10% input accuracy*
High accuracy shunt resistor without field calibration = 0.20% input accuracy
Either shunt resistor with field calibration = 0.10% input accuracy

ATHENA®
The Temperature Control Company

Technical data

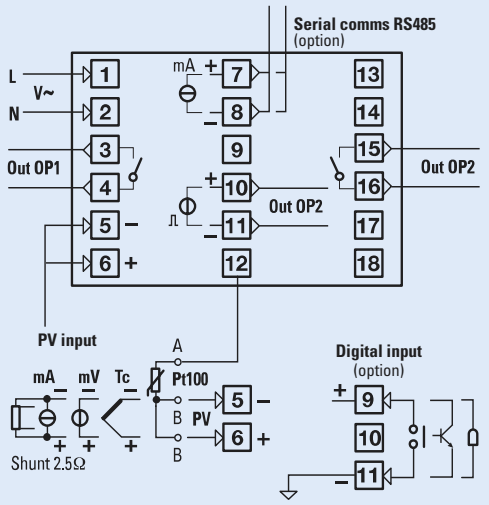
Features at env. 25°C	Description			
Total configurability	From keypad or serial communications, the user selects: type of input; associated functions; alarm types and functionality; control parameter values.			
PV input *(for signal ranges see Table 1)*	Common characteristics	A/D converter with 50.000 points Sampling time: 0.5 sec Update measurement time: 0.2 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)		Between 100 and 240V~ error is minimal
	Resistance thermometer (for ΔT: R1+R2 must be <320Ω)	Pt100Ω at 0°C (IEC 751) °C /°F selectable	2 or 3 wire connection	Line: 20Ω max (3 wire) Thermal drift 0.35°C/10°C env. T. <0.35°C/10Ω line resist.
	Thermocouple	L,J,T,K,S (IEC 584) °C /°F selectable	Internal cold junction compensation	Line: 150Ω max Thermal drift <2μV/°C env. T. <5μV/Ω line resist.
	DC input (current)	0/4..20mA with 2.5Ω ext. Shunt Rj > 10MΩ	Engineering units, floating decimal point, Low Range -999...9999 High Range -999...9999 100 digits minimum	Input drift: <0.1% / 20°C env. T.
	DC input (voltage)	0/10…50mV, Rj >10MΩ		
Digital input (option)	The closure of the external contact produces the following action:		Reset of OP1 output relay	
Operating modes	Limit Controller with 1 alarm		Limit AL1 alarm	AL2 alarm
			OP1 - relay	OP2 - Logic or relay
Control mode	Algorithm	ON/OFF		
	Hysteresis	0.1 ... 10.0% of range		ON/OFF algorithm
OP1 output	SPST relay N.O., 2A/250V~ or 4A/120V~ for resistive load			
OP2 output	Logic (SSR drive) not isolated: 5V–, ± 10%, 30mA max SPST relay N.O., 2A/250V~ or 4A/120V~ for resistive load			
AL2 alarm	Hysteresis 0.1 ... 10.0% of range			
	Action	Active high	Action type	Deviation threshold ± range
		Active low		Band threshold 0…range
				Absolute threshold, whole range
		Special functions	Sensor break	
Ser. comms (opt.)	RS 485 isolated, Modbus/Jbus protocol 1200, 2400, 4800, 9600 bit/sec, two wires			
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		
	Parameters	A non volatile memory stores for unlimited time all the parameter and configuration values		
	Password	A password protects the access to the instrument configuration		
General characteristics	Power supply	100-240V~ (-15% +10%) 50/60Hz or 24V~(-25% +12%), 50/60Hz and 24V– (-15% +25%). Power consumption 2.6W max		
	Safety	Compliance EN61010-1 (IEC 1010-1), installation class 2 (2500V), pollution class 2, class II instrument		
	Electromagnetic compatibility	Compliance to the CE standards for industrial system and equipment		
	Protection EN60529 (IEC 529)	IP65 front panel		
	Overall dimensions	$^1/_{16}$ DIN - 48 x 48, depth 120 mm, weight 130g appr.		
		Panel cut-out: $45^{+0.6}$ x $45^{+0.6}$ mm		
	Operating conditions	Temperature: 0-50 °C		
		Relative humidity: 5-95% non-condensating		
	Approvals	cULus (for regulatory use only), FM		

**Requires field calibration for 0.1% accuracy*

Input type	Scale range	
RTD Pt100Ω a 0°C	-99.9…300.0	°C
	-99.9…572.0	°F
	-200…600	°C
	-328…1112	°F
T/C type L Fe-Const.	0…600	°C
	32…1112	°F
T/C type J Fe-Cu 45% Ni	0…600	°C
	32…1112	°F
T/C type T Cu - CuNi	-200…400	°C
	-328…752	°F
T/C type K Cromel Alumel	0…1200	°C
	32…2192	°F
T/C type S Pt10%Rh-Pt	0…1600	°C
	32…2912	°F
0/4…20 mA	Configurable engineering units	
0/10…50 mV	mA, mV, V, bar, psi, Rh, ph	
Custom input	By request	

Table 1: Process Variable (PV) input

Electrical wirings



Athena Controls, Inc. • 5145 Campus Drive • Plymouth Meeting, PA 19462-1129 • USA
Toll-Free in the USA: 1-800-782-6776 • Tel: 610-828-2490 • Fax: 610-828-7084 • sales@athenacontrols.com • athenacontrols.com