

AR650

Universal controller with single reading



Single-channel universal regulator with elements fuzzy logic PID



**5 COLORS
DISPLAY**
26.72
26.72
26.72
26.72
26.72

- regulation and monitoring of temperature and other physical values (humidity, pressure, level, speed, etc.) processed to a standard electrical signal ($0/4 \div 20\text{mA}$, $0 \div 10\text{V}$, $0 \div 60\text{mV}$, $0 \div 2,5\text{k}\Omega$)
- 1 universal measurement input (thermoresistance, thermocouple, and analog) with memory of the minimum and maximum measured value and a remote data display function (over the MODBUS-RTU protocol)
- BIN programmable digital input to change the controller's mode of operation: control start/stop, manual mode for outputs, step-wise change of the preset value (day/night), keypad block, display indications stop (HOLD function)
- 2 or 3 outputs of ON/OFF type with the following characteristics:
 - output 1 (main): ON-OFF with hysteresis, PID, fuzzy logic (auto-tuning) PID
 - output 2, 3 (auxiliary/alarm): ON-OFF with hysteresis
- analogue output $0/4 \div 20\text{mA}$ or $0/2 \div 10\text{V}$ (constant-control, retransmission)
- advanced function of selecting PID parameters with fuzzy logic elements
- available for binary and analogue outputs, for setting the value of the output signal in the range of $0 \div 100\%$
- digital LED readout with programmable color and illumination brightness
- signaling of alarm states (connected outputs) with a variable display color
- built-in 24 Vdc power supply for supplying on-site transducers
- RS485 serial interface, galvanically isolated, MODBUS-RTU
- compensation of line resistance for resistance sensors
- temperature compensation of thermocouple cold ends
- programmable input, range of indications (for analogue inputs), options for adjustment, alarms, communication, access and other configuration parameter
- access to configuration parameters is protected by the user's password
- methods for configuring parameters:
 - via membrane keyboard (IP65) located on the front panel of the device
 - via RS485 or PRG AR955/GP programmer and freeware: ARsoft-LOG (Windows 7/8/10)
- software and programmer allow you to view the measured value and quickly configure single or few sets of parameters previously saved in the computer for re-use, e.g. in other controllers of the same type (duplicate configuration)
- ingress protection rating: IP65 from the front
- high accuracy, long-term stability and immunity to interference
- optional to choose (in the ordering method): power supply 24Vac/dc, output SSR, analog output $0/2 \div 10\text{V}$, digital input BIN and interface RS485

Contents of set:

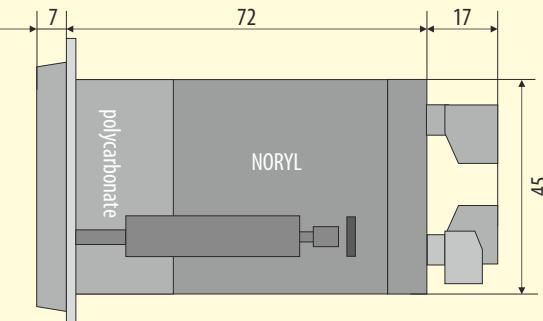
- regulator with handles
- mounting in the window
- user manual
- warranty card

Available accessories:

- programmer AR955/GP (with optional adapter)
- RS485 to USB converter

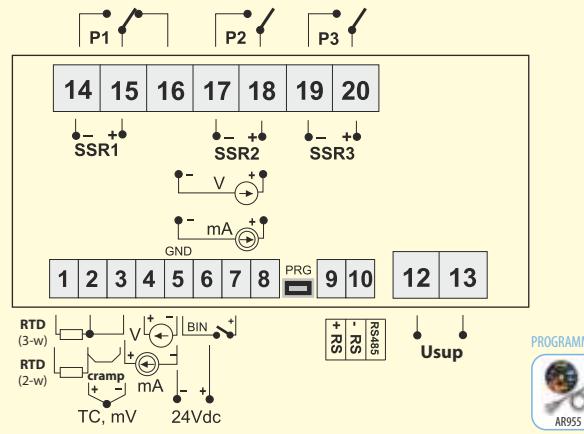
DIMENSIONS, INSTALLATION DATA

Enclosure dimensions	96x48x79 mm
Panel window	92x46 mm
Fixing methods	panel, grips on the side of the enclosure
Material	self-extinguishing polycarbonate NORYL 94V-0



VIEW FROM THE FASTENING HOLDER SIDE

TERMINAL STRIPS, ELECTRICAL CONNECTIONS



How to order

AR650 / / / / / /

Output 3 Code

relay P

SSR S

Analog output Code

$0/4 \div 20\text{mA}$ WA

$0/2 \div 10\text{V}$ WU

Interface RS* Code

interface RS485 RS485

Supply	Code
230 Vac	S1
24 Vac/dc	S2

Outputs 1, 2	Code
relay	P
SSR	S

Output 3	Code
relay	P
SSR	S

Analog output	Code
$0/4 \div 20\text{mA}$	WA
$0/2 \div 10\text{V}$	WU

Interface RS*	Code
interface RS485	RS485

*option for an extra fee

For example:

AR650 / S1 / S / P / RS485 / P

AR650, supply 230 Vac, main output (1) SSR, auxiliary output (2 i 3) relays, interface RS485

TECHNICAL DATA

Universal inputs (programmable)		measurement ranges		
- Pt100 (RTD, 3- or 2-wire)		-200 ÷ 850 °C		
- Ni100 (RTD, 3- or 2-wire)		-50 ÷ 170 °C		
- Pt500 (RTD, 3- or 2-wire)		-200 ÷ 620 °C		
- Pt1000 (RTD, 3- or 2-wire)		-200 ÷ 520 °C		
- thermocouple J (TC, Fe-CuNi)		-40 ÷ 800 °C		
- thermocouple K (TC, NiCr-NiAl)		-40 ÷ 1200 °C		
- thermocouple S (TC, PtRh 10-Pt)		-40 ÷ 1600 °C		
- thermocouple B (TC, PtRh30PtRh6)		300 ÷ 1800 °C		
- thermocouple R (TC, PtRh13-Pt)		-40 ÷ 1600 °C		
- thermocouple T (TC, Cu-CuNi)		-25 ÷ 350 °C		
- thermocouple E (TC, NiCr-CuNi)		-25 ÷ 820 °C		
- thermocouple N (TC, NiCrSi-NiSi)		-35 ÷ 1300 °C		
- current ($R_{we} = 50 \Omega$)		0/4 ÷ 20 mA		
- voltage ($R_{we} = 110 \text{ k}\Omega$)		0 ÷ 10 V		
- voltage ($R_{we} > 2 \text{ M}\Omega$)		0 ÷ 60 mV		
- resistance (3- or 2-wire)		0 ÷ 2500 Ω		
Number of measurement inputs	1			
Response time for measurements (10 ÷ 90%)	0,25 ÷ 3 s (programmable)			
Resistance of leads (RTD, Ω)	$R_d < 25 \Omega$ (for each line)			
Resistance current (RTD, Ω)	400 μA (Pt100, Ni100), 200 μA (remaining)			
Processing errors (at 25°C ambient temperature):				
- basic	- for RTD, mA, V, mV, Ω	0,1 % of measuring range ±1 digit		
	- for thermocouples	0,2 % of measuring range ±1 digit		
- additional for thermocouples				
- additional caused by ambient temperature changes				
Resolution of measured temperature				
Binary inputs (contact or voltage <24V)				
Communication interface (RS485 i PRG, do not use at the same time)	- RS485 (galvanically separated), option	- bitrate 2,4 ÷ 115,2 kb/s, - format 8N1 (8 data bit, 1 bit stop, no parity bit), - MODBUS-RTU protocol (SLAVE)		
	- PRG programming link (no separation), standard			
Outputs (2 relays or SSR)	- relay (P1, P2), standard - SSR (SSR1, SSR2), option	8A / 250Vac (for resistive loads), 1 main (SPDT), 2 additional (SPST-NO) transistor type NPN OC, 11V, internal resistance 440 Ω		
Analogue outputs (1 current or voltage)	- current 0/4÷20 mA (standard)	maximum resolution 1,4 μA (14 bit)		
	- voltage 0/2÷10 V (option)	maximum resolution 0,7 mV (14 bit) output load $Ro < 350 \Omega$		
	- output basic error	output load $Io < 3,7 \text{ mA}$ ($Ro > 2,7 \text{ k}\Omega$) < 0,1 % of output range		
7-segment LCD display with programmable color and brightness				
Signalling	- relays active	LED's red, programmable alarm color of LED display		
	- messages and errors	LED display		
Power supply (Usup)	- 230Vac (standard)	85 ÷ 260 Vac / 3VA		
	- 24Vac/dc (option)	20 ÷ 50 Vac / 3VA, 20 ÷ 72 Vdc / 3W		
Power supply to field transmitters				
Rated operating conditions				
Working environment				
Protection rating				
Weight	~200g			
Electromagnetic compatibility (EMC)				
- immunity: acc. to PN-EN 61000-6-2				
- emission: acc. to PN-EN 61000-6-4				

Version 3.0.1 2013.03.19