AR652
Universal single-channel controller

APAR

Single-channel universal regulator with elements fuzzy logic PID

- control and monitoring of temperature and other physical values (humidity, pressure, level, speed, etc.) processed to a standard electrical signal (0/4÷20mA, 0÷10V, 0÷60mV, 0÷2,5kΩ)
- 1 universal input (thermometer, thermocouple and analogue)
- BIN programmable digital input for changing operational mode of the controller: control start/stop, manual/automatic mode for outputs, two-position switching of the set value (day/night), keyboard lock
- 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÷20mA or 0/2÷10V (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 ÷ 100%
- programmable operation characteristics (process controller, ramping)
- built-in 24 Vdc power supply for supplying on-site transducers
- two-line LED digital readout with adjustable brightness:
  - Upper dispaly - measured value,
  - Bottom dispaly - setpoint of output 1
- 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 parameters
- access to configuration parameters protected with a user 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÷10V, digital input BIN and interface RS485
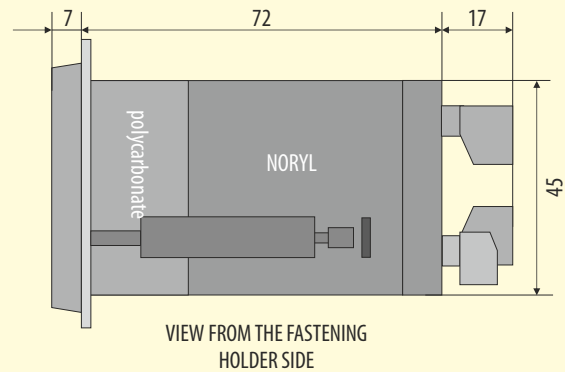
Contents of set:
- regulator with handles mounting in the window
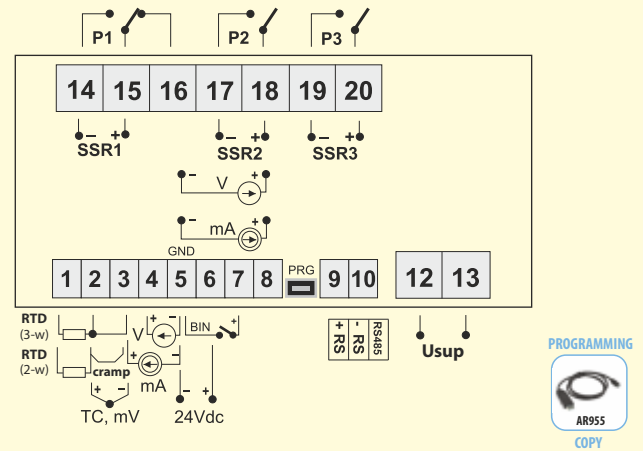- user manual
- warranty card

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

DIMENSIONS, INSTALATTION 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

AR652 / ☐ / ☐ / ☐ / ☐ / ☐

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÷20mA	WA
0/2÷10 V	WU

Interface RS*	Code
interface RS485	RS485

* option for an extra fee

For example:
AR652 / S1 / S / P / RS485 / P
AR652, supply 230 Vac, main output (1) SSR, auxiliary output (2 i 3) relays, interface RS485

www.omi.co.th
บริษัท โอเมก้า เมชเชอริ่ง อินสทรูเม้นท์ จำกัด
Tel: 02 105 4676 • E-mail: info@omi.co.th

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 ($R_{we} = 110\ k\Omega$)		0	÷	10	V
- voltage ($R_{we} > 2\ M\Omega$)		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 (remaning)

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		<2 °C (cold ends temperature)
- additional caused by ambient temperature changes		< 0,003 % of input range /°C

Resolution of measured temperature		0,1 °C
Binary inputs (contact or voltage <24V)		bistable, active level: short-circuit or < 0,8 V
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 (3 relays or SSR)	- relay (P1, P2, P3), standard	8A / 250Vac (for resistive loads), 1 main (SPDT), 2 additional (SPST-NO)
	- SSR (SSR1, SSR2, SSR3), option	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)
		output load Ro < 350 Ω
	- voltage 0/2÷10 V (option)	maximum resolution 0,7 mV (14 bit)
		output load Io < 3,7 mA (Ro > 2,7 kΩ)
	- output basic error	< 0,1 % of output range
7-segment LCD display **with brightness control**	- top	red 4 digits, height 14 mm
	- bottom	green 4 digits, height 10 mm
Signalling	- relays active	LED's red
	- messages and errors	LED dispaly
Power supply (Usup)	- 230Vac (standard)	85 ÷ 260 Vac/ 3VA
	- 24Vac/dc (option)	20 ÷ 50 Vac/ 3VA, 20 ÷ 72 Vdc/ 3W
Power supply to filed transmitters		24Vdc / 30mA
Rated operating conditions		0 ÷ 50°C, <100 %RH (non-condensing)
Working environment		air and neutral gases
Protection rating		IP65 front, IP20 of the connections side
Weight		~200g
Electromagnetic compatibility (EMC)		- immunity: acc. to PN-EN 61000-6-2
		- emission: acc. to PN-EN 61000-6-4