

## GESTRA Steam Systems

Product Range B1

### General-Purpose Industrial Controller URR 3 with Fuzzy-Logic Module

### URR 3

#### Description

The general-purpose controller URR 3 can be used for simple automatic control loops and for the automation of complex control processes.

Due to its high flexibility it can be applied economically to many industrial processes.

The controller comprises a Fuzzy-Logic module for self-optimisation of the control parameters. A serial interface (RS 323 or RS 485/profibus) is available as an option. The controller is provided with a second input which can be used to provide cascade control.

The configuration parameters are stored in an EEPROM. The required supply voltage is selected by a jumper.

The easy-to-read 2 line alphanumeric LCD display facilitates menu-controlled configuration and parameter entry at the place of installation in accordance with the operating conditions.

#### Design

General-purpose controller in a case for panel mounting to DIN 43700 for installation in panels and control cabinets.

Wiring via three plug-in screw terminal blocks on the rear of the controller for conductor sizes up to 0.75 mm<sup>2</sup>.

#### Controller Functions

##### Continuous Controller

PID action

Proportional action coefficient  $K_p$ : 0.1 to 999.9

Reset time  $T_r$  (s): 0.4 s to 9999 s

Derivative action time  $T_d$  (s): 0.0 s to 9999 s

##### Discontinuous controller

Two-point, three-point, three-point stepping controller. A self-optimisation feature which ensures the automatic adaptation of the control parameters to the process is implemented in the general-purpose controller type URR 3. The self-optimisation by adaptation is effected by a **FUZZY-LOGIC MODULE**. A **TUNE MODULE** is provided for non-recurring and direct determination of the control parameters.

#### Technical Data

##### Inputs

###### Controller input 1

Voltage-stable up to  $\pm 39$  V, electrically isolated from outputs

##### Thermocouples

Type	Thermocouple pair	Measuring range	Accuracy
K	Ni-Cr/Ni	-200 to +1370 °C	$< \pm 0.3$ %
J	Fe/Cu-Ni	-200 to +1200 °C	$\pm 1$ digit
T	Cu/Cn-Ni	0 to + 400 °C	
R	Pt 13% Rh/Pt	0 to +1760 °C	
S	Pt 10% Rh/Pt	0 to +1760 °C	

Comparison-point compensation error:

0.5 K  $\pm 1$  digit

Input impedance:  $> 1$  M $\Omega$

Sensor fracture detection

#### Voltage / current

	d.c. voltage	direct current
Input resistance	400 k $\Omega$	$\leq 300$ $\Omega$ DIN IEC 381
Measuring range	0 – 10 V	0/4 – 20 mA
Error	0.1 % $\pm 1$ digit	

#### PT 100 resistance thermometers

Input for PT 100 sensors in acc. with DIN 43760,

for three and four wire connection

Measuring range: -200 °C to 850 °C

Measuring current: max. 0.5 mA

Measuring error: 0.2 %  $\pm 2$  digits

Sensor fracture and short-circuit detection

#### Frequency

Input signal: 200 mVpp to 30 Vpp

Frequency range: 5 Hz up to max. 900 Hz

(frequency end value freely configurable)

Error with zero point, amplification and linearity errors:

$< 0.1$  %

Signal types: ~

Input resistance: 10 K $\Omega$  (static), 9.4 k $\Omega$  (dynamic)

#### Binary input

Signal level 0 = 0 V to 4.5 V,

Signal level 1 = 13 V to 35 V.

Configurable as alarm output,

auto-manual change-over,

external/internal set-point change-over,

safety-value (Ys) output.

#### Controller input 2

Short-circuit protected, voltage-stable up to  $\pm 39$  V, electrically isolated from outputs, and d.c. connected with controller input 1.

Configurable for:

- Follow-up control
- Ratio control
- Feed-forward control
- Fixed set-point control
- Cascade control

#### Potentiometer input for position acknowledgement

1 k $\Omega$  to 10 k $\Omega$

#### Voltage / current

	d.c. voltage	direct current
Input resistance	400 k $\Omega$	$\leq 300$ $\Omega$ DIN IEC 381
Measuring range	0 – 10 V	0/4 – 20 mA
Error	0.1 % $\pm 1$ digit	

#### Frequency

Input signal: 200 mVpp to 30 Vpp

Frequency range: 5 Hz up to max. 900 Hz

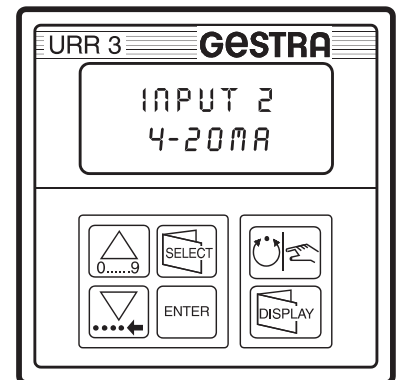
(frequency end value freely configurable)

Error with zero point, amplification and linearity errors:

$< 0.1$  %

Signal types: ~

Input resistance: 10 K $\Omega$  (static), 9.4 k $\Omega$  (dynamic)



#### Outputs

##### Relays

Two volt-free relay contacts, contact rating 250 V, 5 A

##### Current

0 to 20 or 4 to 20 mA max. load resistance 440  $\Omega$

##### Voltage

0 V to 10 V, max. load current 5 mA

##### Line of action

Reversible, if operated as continuous controller, and two-point controller

##### Binary output

Signal level 0 = open

Signal level 1 = 17.5 v to 24 V.

Output current: 20 mA,

short-circuit protected.

Configurable for indication of: alarm function, auto/manual mode, error in sensor or internal error.

##### Alarm / limit values

Two volt-free relay contacts for upper and lower limit values (absolute and relative alarms), contact rating 250 V, 5 A

##### Indication

LCD display, 2 x 8 alphanumeric characters, height and width of characters: 10 x 6 mm, bar graph for deviation, display with illumination

##### Setting

Configuration, parameter definition and operation via menu-controlled keys, in three languages (German, English, French).

##### Case

for panel mounting, dimensions: 96 x 96 x 173 mm  
Weight: 960 g  
Protection IP 65 (front panel)

##### Mains supply

115 V, 50-60 Hz

230 V, 50-60 Hz

(can be jumper-selected)

##### Permissible ambient temperature

0 °C to 55 °C

##### Storage temperature

-20 °C to 60 °C

##### Electric connections

Interfaces: RS 232 or RS 485/Profibus (option)

Sensor supply: 4 V to 20 V d.c. (adjustable)

Max. permissible current: ~ 60 mA

# General-Purpose Industrial Controller

## URR 3

### with Fuzzy-Logic Module

#### Important Notes

Sensors should always be connected with screened cable. If a pneumatic actuator is used an electro-pneumatic transducer is required.

Ensure interference suppression of loads connected to the relay contacts by appropriate wiring.

#### Order and Enquiry Specifications

GESTRA general-purpose controller URR 3, P, PI or PID controller with min. and max. limit values, Fuzzy-Logic module for self-optimisation of control parameters by adaptation, in a case for panel mounting to DIN 43700  
Dimensions: 96 x 96 x 173 mm

#### Inputs:

Current 0 to 20 or 4 to 20 mA  
Voltage 0 V to 10 V  
PT 100 (¾ wire connection)  
Frequency 5 – 900 Hz  
Thermocouples types K, J, T, R, S  
Binary 0/1

#### Outputs:

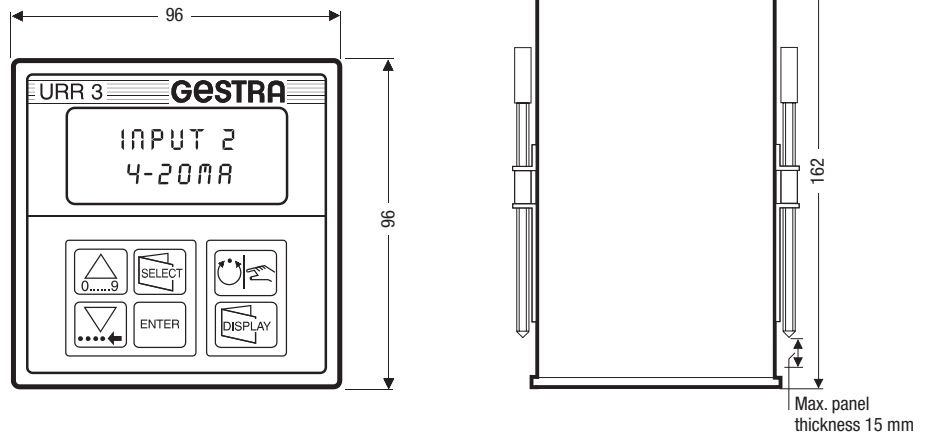
Two volt-free relay contacts  
Current 0 to 20 or 4 to 20 mA  
Voltage 0 V to 10 V  
Binary 0/1  
Two volt-free relay contacts (alarm)  
Supply voltage: 110 V, 50 – 60 Hz  
230 V, 50 – 60 Hz  
Protection: IP 65 (front panel)  
Sensor supply voltage 4 – 20 V d. c.

#### Associated Equipment

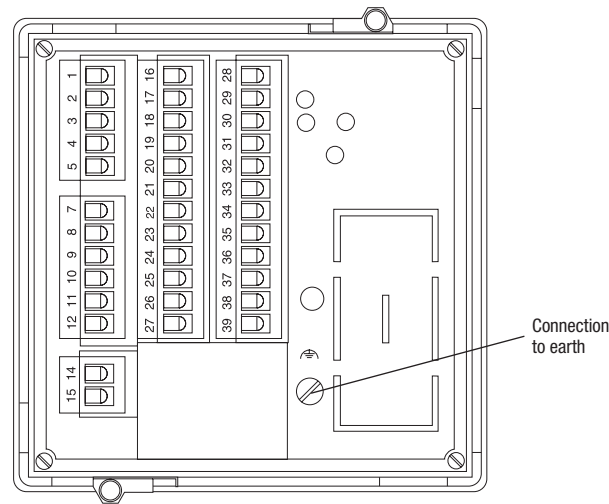
- Resistance thermometer
- Pressure transducer
- Level transmitter type NRT 2-1
- Conductivity transmitter type LRT 1-5 / LRT 1-6
- Pneumatic or electric control valves
- Level transmitter NRGT 26-1
- Conductivity transmitter LRGT 16-1

Supply in accordance with our general terms of business.

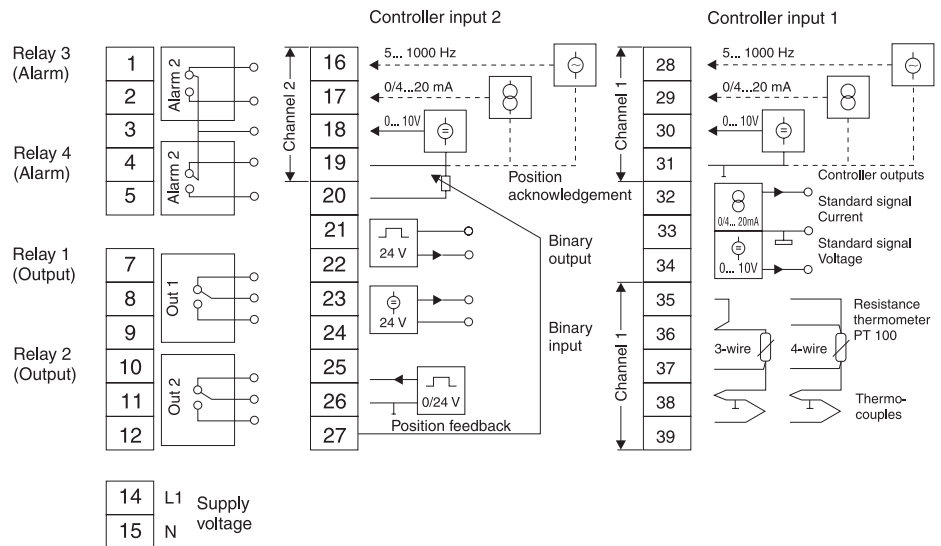
#### Dimensions



#### Wiring Diagram



Rear side of controller



Rear side of controller

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