

GESTRA Steam Systems

Product Range B

Actuator EF 1-40

EF 1-40

Description

The actuator type EF 1-40 is designed for use with suitable controllers to operate control and shut-off equipment (valves, cocks, gate valves, etc.)

The actuator EF 1-40 is approved for operation with GESTRA continuous blowdown valves BAE 46 and BAE 47.

The CAN Bus control element URZ 40 is integrated in the actuator EF 1-40. This allows controlled systems that make use of the CANopen protocol for data exchange via CAN Bus to directly control the actuator EF 1-40 via the integrated control element URZ 40.

The direct control is made possible by

- the controller LRR 1-40 (continuous boiler blowdown control)
- the control, display & operating panel SPECTORcontrol
- adjustable CANopen control equipment produced by other manufacturers

Function

A data telegram with information on the valve position, which is requested by the control system, is sent to the CAN bus. The control element URZ 40 converts the valve position data into a control command and operates the actuator until the feedback potentiometer signals that the preset valve position has been reached.

For further feedback information the control element URZ 40 standardises the value that depends on the valve position and is indicated by the feedback potentiometer (0 – 100 %) and sends it to the CAN bus in the form of a data telegram.

In addition, the data telegram that is sent out cyclically may contain the following error messages:

- Power failure in actuator
- Excessively high temperatures in control element URZ 40
- Fault in feedback potentiometer (parting of a cable, short circuit)
- Both limit switches have been activated
- Wrong sense of rotation
- Feedback potentiometer immobilised

The actuator motors into the preset safety position if

- the data sending cycle is interrupted or
- there is a malfunction in the feedback potentiometer

The activation control of the actuator is switched off if

- both limit switches have been activated
- the sense of rotation is wrong or
- the feedback potentiometer is immobilised

If the sense of rotation is wrong or the feedback potentiometer immobilised the control element URZ 40 tries to restart after approx. 15 sec. (3 times).

Design

The actuator EF 1-40 is attached to the control & shut-off equipment (valves, cocks, slide valves etc.) via a mounting support.

GESTRA continuous blowdown valves BA 46 and BA 47 can be retrofitted with the actuator EF 1-40 (BAE 46, BAE 47).

Technical Data

Actuator

Protection

IP 54 to EN 60529

Motor

230 V \pm 10 %, 50/60 HZ \pm 5 %, cyclic duration factor 100 %, insulation class B to VDE 0530, with starting capacitor 0.18 μ F, 1500 V and RC interference suppression filter

Power consumption

max. 50 W at max. 230 V AC

Angle of rotation

max. 270°

Actuating time

120 s / 90°

Torque

30 Nm

Position-controlled limit switch

2 change-over switches (break / make contact), max. switching capacity 10 (3) A, 250 V AC

Feedback potentiometer

1 k Ω potentiometer, 320° \pm 3 %, RP 19

Cable gland / Electrical connection

1 Cable gland with integral cable clamp, M 20 x 1.5
 1 three-pole terminal strip for connecting the potentiometer, conductor size 1.5 mm²
 1 nine-pole screw-type terminal strip, conductor size 2.5 mm²
 1 two-pole screw-type terminal strip, conductor size 2.5 mm²

For CAN bus connection

M 12 sensor connector, 5 poles, A-coded
 M 12 sensor jack, 5 poles, A-coded

Admissible ambient temperature

0 °C to +70 °C

Control element

Interface

Interface for CAN bus to ISO 11898, CANopen protocol

Supply voltage

18 – 36 V DC, 0.1 A, protected against polarity reversal
 115 – 230 V AC, 4 A, for the motor in the actuator

Inputs

2 Inputs for monitoring the limit switches, opto-isolated, 115 – 230 V AC
 1 Input for detecting zero crossing, opto-isolated, 115 – 230 V AC
 1 Input for signalling the valve position via feedback potentiometer, 1 k Ω

Outputs

2 volt-free relay contacts for actuating the motor
 Contact material AgNi 0.15

Measuring range

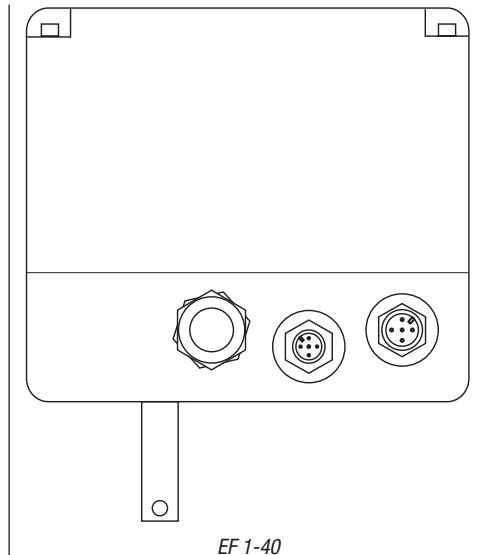
0 – 100 % of the manipulating range, \pm 1 %

Indicators and adjustors

2 Pushbuttons for manual operation and calibration
 5 LEDs for internal status messages
 1 Ten-pole code switch for setting the node ID and the baud rate
 1 four-pole code switch for system configuration

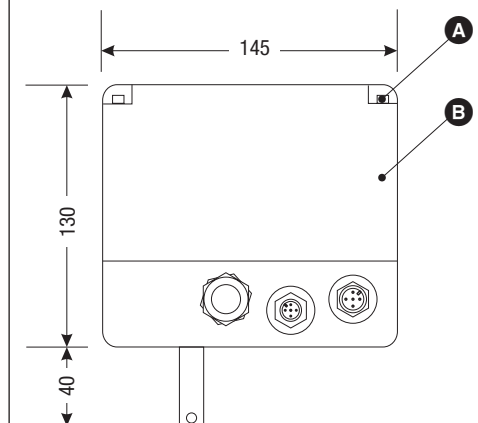
Fault response time

5 sec.



EF 1-40

Dimensions



A Cross-recess cover screws

B Cover

Actuator EF 1-40

Technical Data – continued –

Power consumption
max. 3 W at 24 V DC

Fuse
Electronic thermal fuse T_{max} 85 °C, hysteresis –5 K

Order & Enquiry Specification

GESTRA Actuator EF 1-40 with integrated CAN bus control element URZ 40, supply voltages 18 – 36 V DC, 230 V / 50/60 Hz, data exchange via CAN bus, using CANopen protocol, e. g. for GESTRA continuous blowdown valve BAE 46, BAE 47

Associated Control Equipment

- Controller LRR 1-40
- Control, display & operating panel SPECTORcontrol
- Adjustable CANopen control equipment produced by other manufacturers

Ancillary Equipment

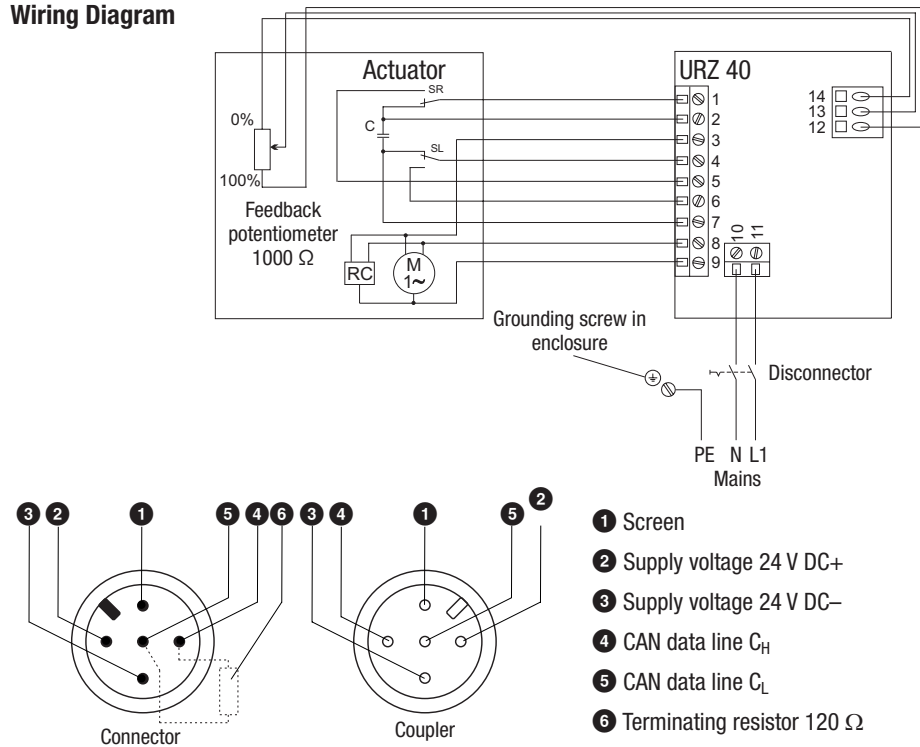
- Operating and display unit URB 2

ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must **not** be used in explosion-risk areas.

Supply in accordance with our general terms of business.

Wiring Diagram



Pin assignment of connector and coupler for CAN bus lines.

Please note:

Electrical connection of actuator

Flexible three-core cable, e. g. Ölflex Classic 110, manufactured by LAPP, 3 x 0.75 mm² is required for wiring the actuator.

Bus cable, cable length and size

Multi-core twisted-pair control cable, e. g. UNITRONIC® BUS CAN 2 x 2 x ..mm²; Li2YCY 2 x 2 x ..mm² **must** be used as bus line.

Preassembled cable assemblies (with connector and coupler) of various lengths available as optional extra.

The cable length dictates the baud rate (data transfer rate) between the bus nodes, and the total power consumption of the sensors dictates the conductor size.

S 8	S 9	S 10	Baud rate	Cable length	Number of pairs and conductor size [mm ²]
OFF	ON	OFF	250 kBit/s	125 m	2 x 2 x 0.34
Factory setting					
ON	ON	OFF	125 kBit/s	250 m	2 x 2 x 0.5
OFF	OFF	ON	100 kBit/s	335 m	2 x 2 x 0.75
ON	OFF	ON	50 kBit/s	500 m	available on demand (depends on bus configuration)
OFF	ON	ON	20 kBit/s	1000 m	
ON	ON	ON	10 kBit/s	1000 m	

The baud rate is set via code switch. Default baud rate setting of control element URZ 40a: 250 kbit/s (cable length up to 125 m). For longer cable lengths reduce the baud rate setting accordingly. Make sure that all bus nodes feature the same setting.

Voltage supply of CAN bus

To guarantee trouble-free operation of the CAN bus system make sure that the voltage supply is sufficient for the application. Please use the following table to check the supply voltages of your bus system.

Controller with supply voltage	Qty.	Power output per item of equipment	Sum 1
	x	6 W	= W
Sensor, transmitter, control elements, operating & display unit URB 1	Qty.	Power output per item of equipment	Sum
	x	3 W	= W
Operating & display unit URB 2	x	5 W	= W
		Sum 2	= W

If sum 2 exceeds sum 1 provide the CAN bus with a separate stabilised safety power supply unit (e. g. SITOP Smart 24 V 2.5 A) with 24 V DC. The power supply unit must meet the requirements of DIN VDE 0106 (safe isolation) and be provided with an overcurrent protective device according to EN 61010-1/VDE 0411.

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