

OPEN AIR™
Air damper actuators

GDB..3..2
GLB..3..2

Linear version, three-position control,
AC 24 V or 230 V



Electric motor-driven linear actuators for three-position control, nominal linear force 125 / 250 N, nominal travel 60 mm, AC 24 V or AC 230 V operating voltage, pre-wired with connecting cables of 0.9 m.
Type-specific variations with adjustable auxiliary switches for supplementary functions or with potentiometer for position indication.

Use

In ventilating and air conditioning plants to actuate air dampers

- with nominal linear force of
 - 125 N for damper areas of approx. up to 0.8 m² and
 - 250 N for damper areas of approx. up to 1.5 m²
- ideal for modulating three-position controllers or ON/OFF controls (e.g., outside air dampers, flue gas dampers, etc.)

Type summary

Nominal force	Operating voltage					
	AC 24 V			AC 230 V		
	Standard version	with auxiliary switch	with positioner	Standard application	with auxiliary switch	with positioner
125 N	GDB131.2E	GDB136.2E	GDB132.2E	GDB331.2E	GDB336.2E	GDB332.2E
250 N	GLB131.2E	GLB136.2E	GLB132.2E	GLB331.2E	GLB336.2E	GLB332.2E

Ordering

You **cannot later install** auxiliary switches and positioners (potentiometer). For this reason, order the type that includes the desired options.

Connecting cables

The actuator comes with 0.9 m long pre-wired connecting cables.

**Accessories,
spare parts**

Drive shaft connector **ASK55.2**
Suitable for rodding shafts of dia. 5...8 mm and □ 5...8 mm
as well as for linear travel limitation. This unit is fitted to the push rod.

Equipment combinations

These actuators can be connected to all control devices with a three-position output supplying a switching voltage of AC 24 V or AC 230 V.

Functions

Basic functions

Linear travel

The push rod's travel movement is subject to the electrical control.

As soon as the operating voltage AC 24 V or AC 230 V is applied, the push rod starts to move.

Three-position control

The push rod can be operated as follows via actuator control:

- Push rod travels outward (0...60 mm)
- Push rod travels inward (60 mm...0)

With no current applied, the push rod remains in its current position.

Manual adjustment

When no voltage is supplied, you can disengage the gear train and manually adjust the push rod or the air damper by means of the red slider.

Mechanical limitation of linear travel

The linear travel limitation can be set stepless between 0 and 60 mm. The linear travel can be limited, e.g., by adjusting the ASK55.2 drive shaft connector on the push rod (see "Accessories").

Type-specific functions

Adjustable auxiliary switches

Auxiliary switches provide supplementary functions. The switching points for auxiliary switches A and B (one changeover switch each) can be set independently in increments of 3.3 mm within the 0...60 mm linear span.

Refer to "Technical design", "Commissioning notes", and "Diagrams".

Electrical position indication

The integrated potentiometer can be connected to voltage as a positioner; refer to "Technical data". The voltage applied is proportional to the actuator's linear travel.

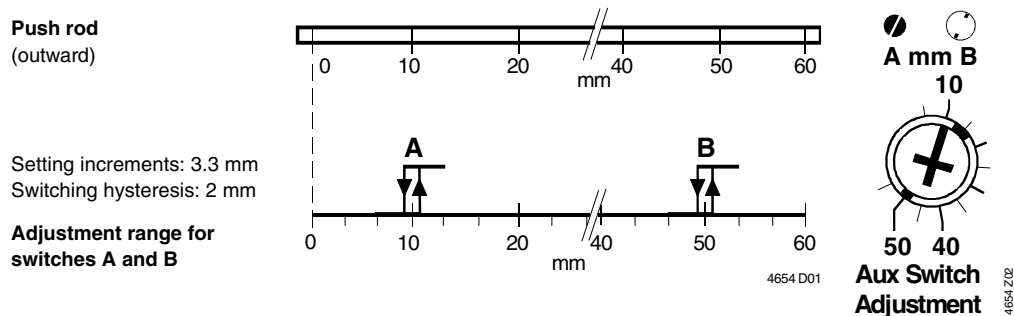
Technical design

Motor technology

A reversible synchronous motor enables accurate speed control. The magnetic coupling serves as a torque limitation on overload to protect both actuator and dampers.

Adjustable auxiliary switches (type-specific)

The illustration below shows the adjustable switching values for auxiliary switches A and B in relation to the linear length.



Note

The setting shafts for the auxiliary switches turn together with the actuator. The scales are valid only for the **zero position of the actuator** on "**outward**" linear travel.

Mechanical design

Basic components

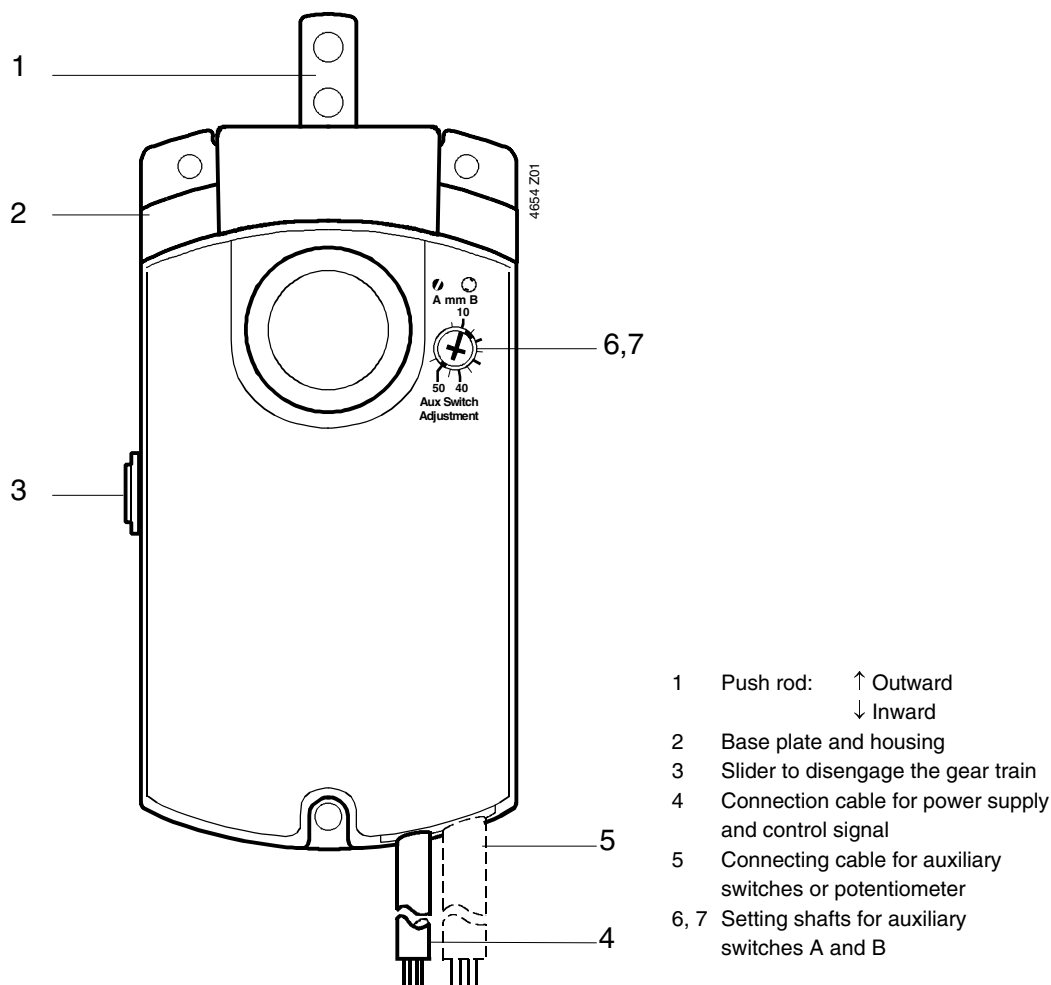
Housing	A robust, light-weight plastic housing and a gear train plate made from steel guarantee an extended actuator life even under severe environmental conditions.
Gear train	Maintenance-free and noise-free gear train with stall and overload protection for the life of the actuator.
Push rod	The push rod allows for <ul style="list-style-type: none"> • direct transfer of linear force • or conversion to rotary movement
Slider for manual adjustment	The red slider on the side serves for manually releasing and adjusting the push rod.
Electrical connection	All actuators are equipped with pre-wired 0.9 m long connecting cables.

Type-specific elements

Auxiliary switch	For supplementary functions, the auxiliary switches A and B can be adjusted on the actuator front (top right).
Potentiometer for position indication	A potentiometer has been integrated as a positioner for the electrical position indication of the damper position.

Setting and operating elements

Refer to "Technical design" and "Commissioning notes" in this data sheet.



Engineering notes



The basic system data for the control systems in use contain all engineering information; refer to this data prior to mounting, wiring, and commissioning the actuator and carefully read all safety information.

Intended use


Use these actuators in a system only for applications as described in the basic system documentation of the applied control systems. Additionally, include all actuator-specific features and conditions as described in the brief description on the title page of this data sheet (bold print) and in the chapters "Use", "Engineering notes", and "Technical data".




The sections flagged with a warning symbol as illustrated in the left margin contain safety-related requirements and restrictions; it is important that you adhere to them to prevent physical injuries or equipment damages.

 AC 24 V supply


Operate the actuators only on **safety extra-low voltage (SELV)** or **protection by extra-low voltage (PELV)** as per HD 384.

 AC 230 V supply

The actuators are double-insulated and do not provide a connection for the protective ground.

 Auxiliary switches A, B

Apply **only mains voltage** or **only safety extra-low voltage** to the switching outputs of auxiliary switches A and B. Mixed operation is not permissible. However, operation using various phases is permissible.

 Potentiometer for positioner

Consider the potentiometer's electric data (max. load and sliding contact current).



Caution, maintenance

Do not open the actuator!

The unit is maintenance-free. Any repair work must be conducted by the manufacturer only.

Electric parallel connection of actuators

Electric connection in parallel of the GDB...2 actuators with GLB...2 is permissible only if the operating voltage is within the required tolerance. Remember to include voltage drops at the feed lines.

A relay must be used for electric connection in parallel when the actuators are operated with SQE...2, SQR...2, GBB...2 or GIB...2.

Required actuator type

Selection of the actuator depends on the required linear force. Determine your type of actuator from the below table:

If the linear force is	then use type
$\leq 125 \text{ N}$	GDB...3..2 (125 N)
$\leq 250 \text{ N}$	GLB...3..2 (250 N)
$\leq 440 \text{ N}$	GBB...3..2 (440 N)

Sizing transformers for AC 24 V (SELV)

- Use safety insulating transformers with double insulation as per EN 60 742; the transformers must be made for 100% runtime.
- Observe all local safety rules and regulations pertaining to sizing and protection of transformers.
- Determine the transformer's power consumption by adding up the power consumption in VA for all actuators used.

Wiring and commissioning

Refer to "Commissioning notes" and "Diagrams" in this data sheet as well as to the HVAC job drawings.

Mounting notes





Mounting instructions	All information and steps to properly prepare and mount the actuator are listed in the Mounting Instruction guide supplied with the actuator.
Mounting position	Choose the actuator's mounting position so that you can easily access the cables as well as the setting shafts on the actuator front. Refer to "Dimensions".
Linear force support	<ul style="list-style-type: none">• Rotary damper application: To support the linear force, a stable support for the actuator in accordance with e.g. the Mounting Instructions is required.• Linear damper application: Fasten the actuator to the wall using 3 screws (dia. 4 mm).
Manual adjustment	Disconnect the voltage supply before manually adjusting the push rod via the red slider.
Mechanical limitation of linear travel	Where required, the linear travel can be limited by selecting a specific damper level length or by using the ASK55.2 drive shaft connector (see "Type summary").

Commissioning notes

References	<p>For commissioning, the following reference documentation must exist:</p> <ul style="list-style-type: none">• This data sheet: N4654• Mounting instructions M4664• Job diagram
Ambient conditions	Check to ensure that all permissible values as contained in the "Technical data" have been observed.
Mechanical check	<ul style="list-style-type: none">• Check for proper mounting and to ensure that all mechanical settings correspond to the plant-specific requirements. Additionally, ensure that the dampers are shut tight when in the closed position.• Check the linear travel direction• Use the red slider (while no voltage is supplied) to manually adjust the dampers or the push rod.• Check the linear force support: the actuator's fastenings must be stable for the maximum possible tight close-off for the dampers.
Electrical check	<ul style="list-style-type: none">• Check to ensure that the cables are connected in accordance with the plant wiring diagram (see "Diagrams").• The operating voltage AC 24 V or AC 230 V (SELV/PELV) must be within the tolerance values.• Functional check:<ul style="list-style-type: none">Control signal AC 24 V<ul style="list-style-type: none">– between wires 1-6 : "Outward" travel of the push rod– between wires 1-7 : "Inward" travel of the push rodControl signal AC 230 V<ul style="list-style-type: none">– between wires 4-6 : "Outward" travel of the push rod– between wires 4-7 : "Inward" travel of the push rod<p>The actuator remains in its current position if no control signal is applied.</p>• When the push rod travels inward or outward, measure the potentiometer's change of resistance.• While the actuator reaches the respective switching positions the auxiliary switch contacts "A" and "B" must change.

Switches A and B:	The auxiliary switches have the following factory settings:
Factory setting	Switch A: Switching point at 3.3 mm
	Switch B: Switching point at 55.3 mm
	The settings for A and B can be set to the desired values using the setting shafts; refer to "Technical design".
Note	<ul style="list-style-type: none"> In order to ensure an exact switching position for switches A and B, refer to "Adjustable auxiliary switches" under the "Technical design" heading. The linear travel scales are valid only for the zero position of the actuator on linear travel direction "outward".

Technical data

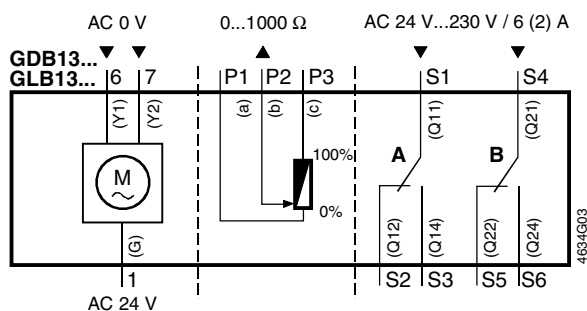
 Power supply AC24 V for GDB / GLB131.2E GDB / GLB132.2E GDB / GLB136.2E	Operating voltage Safety extra-low voltage (SELV) or Protection by extra-low voltage (PELV) as per Requirements of external safety insulating transformer (100% ED) Supply line fuse Frequency Power supply (with control signal) Power supply (with control signal)	AC 24 V ± 20 % HD 384 as per EN 60742 max. 10 A 50/60 Hz 83 mA 2 VA/1 W
 AC230 V supply for GDB / GLB331.2E GDB / GLB332.2E GDB / GLB336.2E	Operating voltage Supply line fuse Frequency Power supply (with control signal) Power supply (with control signal)	AC 230 V ± 10 % max. 10 A 50/60 Hz 8.7 mA 2 VA/1 W
Mechanical data	Linear force GDB..3..2E Nominal force Minimum linear force (with/without operating voltage) Maximum linear force Linear force GLB..3..2E Nominal force Minimum linear force (with/without operating voltage) Maximum linear force Nominal travel Maximum linear travel (mechanical limitation) Runtime for nominal travel, motor operation at 50/60 Hz Linear travel direction (defined by signal on wire 6 or 7) Mechanical life	125 N > 125 N < 180 N 250 N > 250 N < 350 N 60 mm 62 ± 2 mm 150 s / 125 s 0...60 mm / 60...0 mm 10 ⁵ cycles
 Inputs	Control signals AC 24 V Wires 1-6 Wires 1-7 Control signals AC 230 V Wires 4-6 Wires 4-7	outward inward outward inward
Outputs		
 Auxiliary switch for GDB / GLB136.2E GDB / GLB336.2	Number of changeover switches Life: 6 A resistive, 2 A inductive 5 A resistive, 1 A inductive without load Switching voltage Nominal current resistive/inductive Insulation resistance between auxiliary switches and housing Switching range of the auxiliary switches Setting increments Switching hysteresis Factory changeover settings Switch A Switch B	2 10 ⁴ switchings 5 x 10 ⁴ switchings 10 ⁶ switchings AC 24...230 V 6 A / 2 A AC 4 kV approx. 3.3...55.3 mm approx. 3.3 mm 2 mm 3.3 mm 55.3 mm
Positioner for GDB / GLB132.2E GDB / GLB332.2E	Potentiometer Change of resistance (wires P1-P2) Load Maximum sliding contact current Insulation resistance between potentiometer and housing	0...1000 Ω < 1 W < 10 mA AC 500 V

Wire connections	Cable lengths	0.9 m
	Supply AC 24 V (wires 1, 6, 7) / AC 230 V (wires 4, 6, 7)	3 x 0.75 mm ²
	Auxiliary switches A and B (wires S1...S6)	6 x 0.75 mm ²
	Potentiometer (wires P1-P2)	3 x 0.75 mm ²
Housing protection	Degree of protection as per EN 60 529	IP 40
Protection class	Insulation class	
	AC 24 V	III
	AC 230 V	II
	Auxiliary switch	II
Environmental conditions	Operation	IEC 721-3-3
	Climatic conditions	Class 3K5
	Mounting location	interior, weather-protected
	Temperature	-30...55 °C
	Humidity (non-condensing)	< 95% r.h.
	Transport	IEC 721-3-2
	Climatic conditions	Class 2K2
	Temperature	-30...60 °C
	Humidity (non-condensing)	< 95% r.h.
	Mechanical conditions	Class 2M3
Standards	Product safety	
	Automatic electrical controls for household and similar use (type 1)	EN 60 730-2-14
	Electromagnetic compatibility	
	Immunity	EN 50 082-2
	Emissions	EN 50 081-1
	CE Conformity	
	Electromagnetic compatibility as per Low voltage directive	89/336/EEC 73/23/EEC
Dimensions	Actuator	
	W x H x D	68 x 152 x 59 mm
	see Dimensions	
Weight	Without packaging	0.48 kg

Diagrams

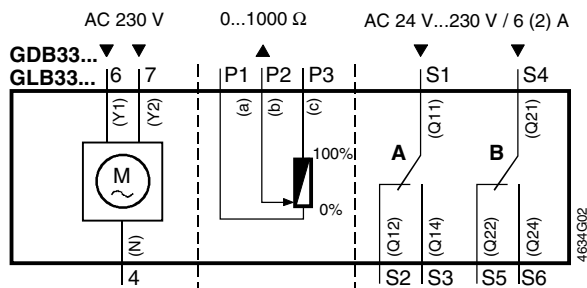
Internal diagram

GDB/ GLB131.2E
GDB/ GLB132.2E
GDB/ GLB136.2E



AC 24 V (SELV/PELV)

GDB/ GLB331.2E
GDB/ GLB332.2E
GDB/ GLB336.2E

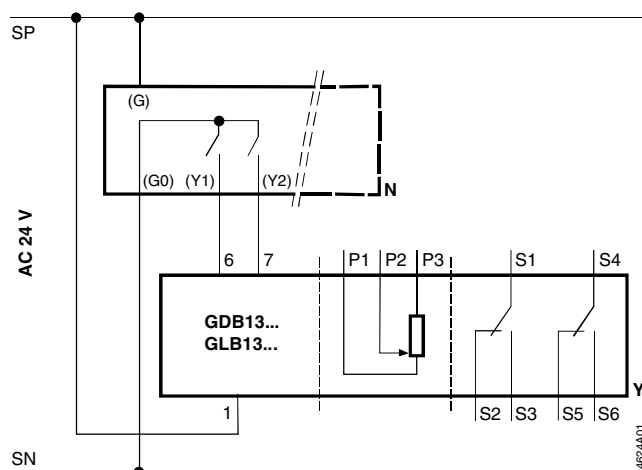


AC 230 V

Cable	Wire labeling	Designation	Color	L&G terminal code
Actuator AC 24 V	1	System potential AC 24 V	red	G
	6	Control signal AC 24 V (0 V) , outward travel	purple	Y1
	7	Control signal AC 24 V (0 V) , inward travel	orange	Y2
Actuator AC 230 V	4	Neutral conductor	blue	N
	6	Control signal AC 230 V, outward travel	black	Y1
	7	Control signal AC 230 V, inward travel	white	Y2
Auxiliary switch	S1	Switch A Input	gray/red	Q11
	S2	Switch A Normally closed contact	gray/blue	Q12
	S3	Switch A Normally open contact	gray/pink	Q14
	S4	Switch B Input	black/red	Q21
	S5	Switch B Normally closed contact	black/blue	Q22
	S6	Switch B Normally open contact	black/pink	Q24
Positioner	P1	Potentiometer 0...100 % (P1-P2)	white/red	a
	P2	Potentiometer pick-off	white/blue	b
	P3	Potentiometer 100... 0 % (P3-P2)	white/pink	c

Connection diagram

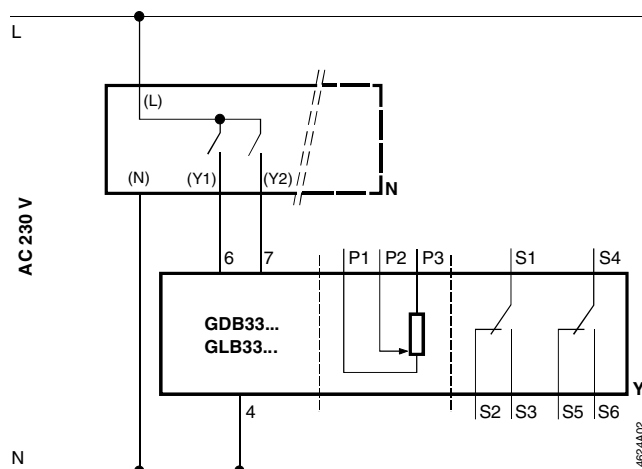
GDB/ GLB131.2E
GDB/ GLB132.2E
GDB/ GLB136.2E



AC 24 V (SELV/PELV)

N Regulator or controller
Y Actuator, three-position:
GDB / GLB13..2, AC 24 V
SP System potential AC 24 V
SN System neutral

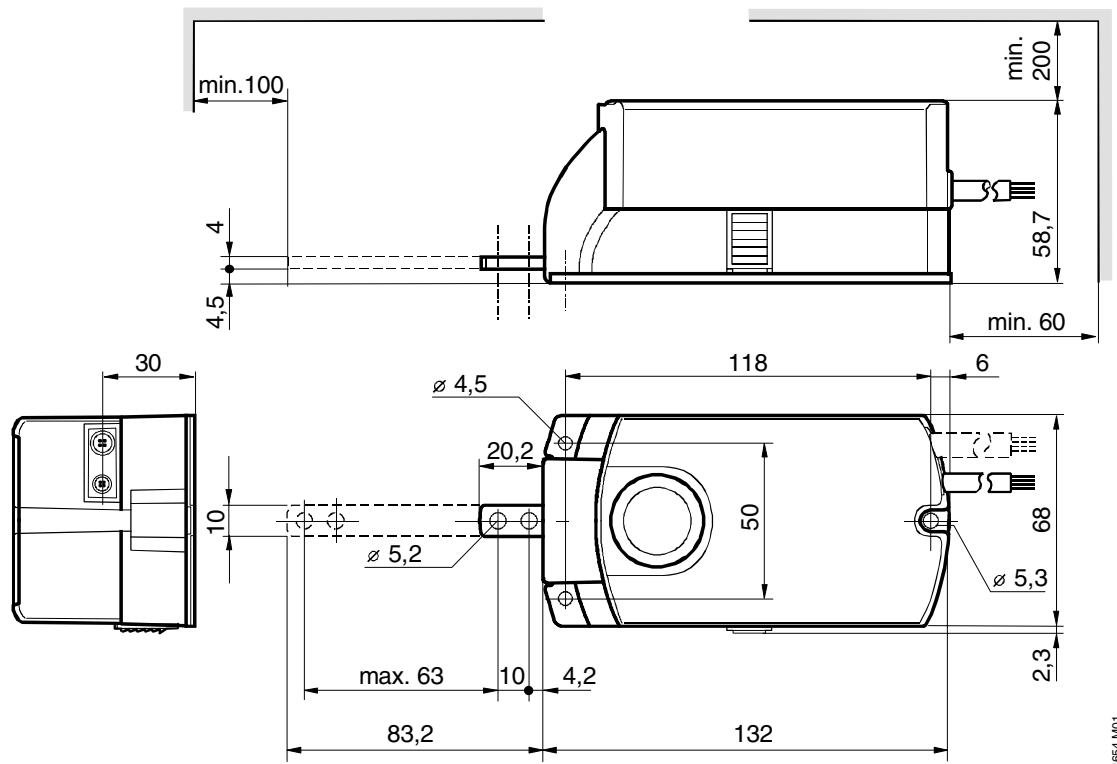
GDB/ GLB331.2E
GDB/ GLB332.2E
GDB/ GLB336.2E



AC 230 V

N Regulator or controller
Y Actuator, three-position:
GDB / GLB33..2, AC 230 V
L Phase conductor AC 230 V
N Neutral conductor

Dimensions



4654 M01

Dimensions in mm

