

OpenAir™

Air damper actuators

GBB..1E



Electromotoric rotary actuators for 2-position, 3-position, and modulating control

- Nominal torque: 25 Nm
- Operating voltage: AC 24 V ~ / DC 24 V = or AC 100...240 V ~
- Mechanically adjustable span between 0...90°
- Pre-wired with standard 0,9 m connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: mechanical and electrical
- Feedback potentiometer
- Self-adaptation of the rotation angle range and adjustable auxiliary switches for supplemental functions

Rotary actuators are used in ventilation and air conditioning plants to regulate and shut off air dampers:

- For damper areas up to approximately 5 m² (Guideline: Always comply with the damper manufacturer's specifications).
- Suitable for use with 2-position and 3-position controllers as well as modulating controllers (DC 0/2...10 V) to control air dampers.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-position control to ensure continuous and accurate operation.

Functions

GBB..	AC 24 V ~ / DC 24 V –	141.1E / 145.1E / 146.1E	161.1E / 163.1E / 164.1E / 166.1E
	AC 100...240 V ~	341.1E / 345.1E / 346.1E	-
Control type	2-position / 3-position		Modulating control (0/2...10 V)
Rotation	Clockwise or counterclockwise direction depends ...		
	<ul style="list-style-type: none"> • ... on the type of control. 	<ul style="list-style-type: none"> • ... on the setting of the DIL clockwise/counterclockwise switch; <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>CW</p> </div> <div style="text-align: center;"> <p>CCW</p> </div> </div> <ul style="list-style-type: none"> • ... on the positioning signal. 	
	The actuator remains in the respective position with no power applied.	The actuator remains in the deployed position:	
		<ul style="list-style-type: none"> • ... if the positioning signal is maintained at a constant value; • ... in the event of power loss. 	
Position indication	mechanical	Rotation angle position indication using a position indicator.	
	electrical	-	Position indicator: Output voltage U = DC 0/2...10 V is generated proportionally to rotation angle. The direction of rotation (inverted or non-inverted) for output voltage U is based on the DIL switch position.
Auxiliary switches	The switching points for auxiliary switches A and B can be set independently in increments of 5° from 0° to 90°.		
Self-adaptation of rotation angle range	-	The actuator automatically determines the mechanical end positions of the rotation angle range. The characteristic function (U _o , ΔU) is mapped to the calculated rotation angle range. Power must be applied for the function of DIL switch 2 (self-adaptation) to be operational.	
Manual adjustment	The actuator can be manually adjusted by pressing the gear train disengagement button.		
Rotation angle limitation	The rotation angle of the shaft adapter can be limited mechanically in increments of 5°.		

Technical design

Housing

- Robust and light cast aluminum housing. The housing guarantees long life, even under challenging ambient conditions.

Actuator / gears

- Brushless, robust DC motors ensure reliable operation regardless of load. The valve actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end position.
- The gears are maintenance free and low noise.

Type summary

Type	Stock no.	Control	Operating voltage	Positioning signal Y	Position indicator U = DC 0...10 V –	Feedback potentiometer 5 kΩ	Self-adapting rotation angle range	Aux. switch	Rotation direction switch	
GBB141.1E	S55499-D813	2- or 3-position	AC 24 V ~ / DC 24 V =	-	No	No	No	0	No	
GBB145.1E	S55499-D814					Yes		2		
GBB146.1E	S55499-D815					No		0		
GBB341.1E	S55499-D820		AC 100...240 V ~			Yes		2		
GBB345.1E	S55499-D821					No				
GBB346.1E	S55499-D822									
GBB161.1E	S55499-D816	Modulating	AC 24 V ~ / DC 24 V =	DC 0/2...10 V –	Yes	No	Yes	0	Yes	
GBB163.1E	S55499-D817							DC 0...35 V =		2
GBB164.1E	S55499-D818									
GBB166.1E	S55499-D819							DC 0/2...10 V –		

Accessories/spare parts

See data sheet N4699.

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators	A6V14252663
Technical principles	Drehantriebe ohne Federrücklauf GBB/GIB..1	Z4626
Mounting instructions	Drehantriebe GBB..1E, GIB..1E	A6V14196968
Data sheet	Zubehör und Ersatzteile für Luftklappen-Stellantriebe - ASC.., ASK..	N4699

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

<http://siemens.com/bt/download>

Safety

⚠ CAUTION**National safety regulations**

Failure to comply with national safety regulations may result in personal injury and property damage.

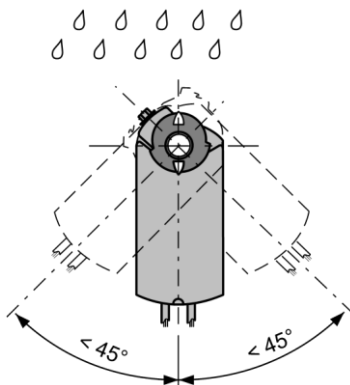
- Observe national provisions and comply with the appropriate safety regulations.
- Mounting, commissioning, and service by properly trained personnel only.

Engineering

Auxiliary switch and potentiometer

Cannot be integrated after the fact.

Mounting



See mounting instructions A6V14196968.

Shaft connection

When mounting, comply with the notes on shaft diameters and damper surface areas (Use [► 2], Technical data [► 9]) and use only quality materials typical to the sector for the damper shaft.

Installation

⚠ WARNING**No internal line protection for supply lines to external consumers**

Risk of fire and injury due to short-circuits!

- Adapt the wire cross sections as per local regulations to the rated value of the installed fuse.

Maintenance

The GBB..1E actuators are maintenance-free.

Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.

For additional details, refer to [Siemens information on disposal](#).

Power supply (GBB1..1E)			
Operating voltage (SELV/PELV)		AC 24 V ~ ± 20 % (19.2...28.8 V ~) DC 24 V = ± 20 % (19,2...28,8 V =) ¹⁾	
Frequency		50/60 Hz	
Power consumption	Running	GBB14..1E	2,1 VA / 1,4 W
		GBB16..1E	2,2 VA / 1,5 W
	Holding	GBB14..1E	0,8 VA / 0,5 W
		GBB16..1E	0,9 VA / 0,5 W

Power supply (GBB3..1E)			
Operating voltage (SELV/PELV)		AC 100...240 V ~ ± 10 % (90...264 V ~)	
Frequency		50/60 Hz	
Power consumption	Running	GBB34..1E	3,5 VA / 2,0 W
	Holding	GBB34..1E	1,5 VA / 1,0 W

Functional data		
Torque	Nominal	25 Nm
	Maximum (when blocked)	38 Nm ²⁾
	Minimum (holding)	25 Nm
Rotation angle	Nominal (with position indication)	90°
	Maximum (mechanically limited)	95° ± 2°
Runtime at nominal rotation angle 90°		150 s
Actuator sound power level (at positioning time of 150 s)		<45 dB(A)

Inputs			
Positioning signal for GBB14..1E	Operating voltage AC 24 V ~ / DC 24 V =	(wires 1-6/G-Y1)	Clockwise
		(wires 1-7/G-Y2)	Counterclockwise
Positioning signal for GBB34..1E	Operating voltage AC 100...240 V ~	(wires 4-6/N-Y1)	Clockwise
		(wires 4-7/N-Y2)	Counterclockwise
Positioning signal for GBB16..1E	Input voltage	(wires 8-2/Y-G0)	DC 0/2...10 V =
	Power consumption		0.1 mA
	Input resistance		>100 kΩ
Max. permissible input voltage		DC 35 V = internally limited to DC 10V =	
Protected against faulty wiring		Max. AC 24 V ~ / DC 24 V =	
Hysteresis	for non-adjustable characteristic function	60 mV	
	for adjustable characteristic function	0.6 % von ΔU	

Inputs			
Adjustable characteristic (GBB163.1E, GBB164.1E)			
	Adjustable with 2 potentiometers	Offset U_0	DC 0...5 V =
		Span ΔU	DC 2...30 V =
	Max. input voltage		DC 35 V =
	Protected against faulty wiring		Max. AC 24 V ~ / DC 24 V =

Outputs			
Position indicator	Output signal GBB16..1E	(wires 9-2/U-G0)	
	Output voltage U		DC 0...10 V =
	Max. output current		DC \pm 1 mA
	Protected against faulty wiring		Max. AC 24 V ~ / DC 24 V =
Feedback potentiometer (for GBB145.1E, GBB345.1E)	Change in resistance	(wires P1-P2)	0...5000 Ω
	Load		<0.25 W
	Max. contact current		<0.1 mA
	Permissible voltage at potentiometer (SELV/PELV)		AC 24 V ~ / DC 24 V =
	Insulation resistance between potentiometer and housing		AC 500 V ~

Auxiliary switches (GBB146.1E, GBB164.1E, GBB166.1E, GBB346.1E)			
Switching voltage		AC 24...250 V ~ / DC 12...30 V =	
Contact loading		6 A resistive, 2 A inductive, min. 10 mA @ AC 4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V = 0.8 A resistive, 0.5 A inductive, min. 10 mA @ DC 60 V =	
Electric strength of aux. switches against housing		AC 4 kV	
Switching range for aux. switches /setting increments		5...90° / 5°	
Factory setting:	Switch A	5°	
	Switch B	85°	

Connection cables	
Cable length	0.9 m
Cross-section	0.75 mm ²
Permissible length for signal wires	300 m

Safety classes and degree of protection		
Protection class		EN 60730
	AC 24 V ~ / DC 24 V =, feedback potentiometer	III
	AC 100..240 V ~, aux. switches	II
Degree of protection of housing		IP54 as per EN 60529 (see Mounting [▶ 4], and mounting instructions A6V14196968)

Environmental conditions		
Operation		IEC 60721-3-3
	Climatic conditions	Class 3K23
	Mounting location	Interior, weather-protected
	Temperature	-32...55 °C
	Humidity, non-condensing	<95 % r.h.
Transport		IEC 60721-3-2
	Climatic conditions	Class 2K12
	Temperature	-32...70 °C
	Humidity, non-condensing	<95 % r.h.
Storage		IEC 60721-3-1
	Climatic conditions	Class 1K22
	Temperature	-32...50 °C
	Humidity, non-condensing	<95 % r.h.
Mechanical conditions		IEC 60721-3-2 Class 2M4

Standards, directives and approvals	
Product standards	EN60730 Part 2-14: Particular requirements for electric actuators
Electromagnetic compatibility (field of use)	For residential, commercial, and industrial environments
EU conformity (CE)	A5W00004366 ³⁾
RCM conformity	A5W00004367 ³⁾
EAC compliance	Eurasian conformity
UKCA conformity	A5W00198137A ³⁾
UL Federal Communications Commission	UL as per 60730 http://ul.com/databse cUL as per CSA-C22.2 No. 24-93

Environmental compatibility

The product environmental declaration A5W00712474A ³⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions

Actuator W x H x D		See Dimensions [▶ 12])
Damper shaft	Round	8...25,6 mm
	Square (diagonal)	6...18 mm
	Min. length	20 mm
	Max. shaft hardness	<300 HV

Weight

Excl. packaging	Without aux. switches	Max. 2,2 kg
	With aux. switches	Max. 2,35 kg

¹⁾ cUL: Permissible only to DC 30 V =

²⁾ See comments in Use [▶ 2] and below (Technical data [▶ 9]).

³⁾ Documents can be downloaded at <http://siemens.com/bt/download>.

NOTICE



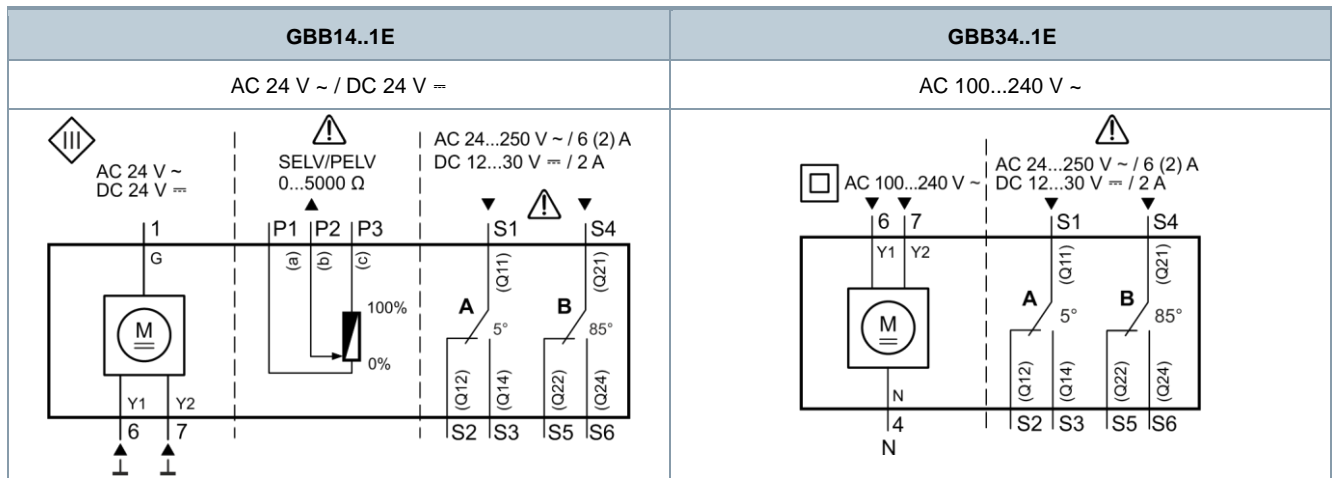
Shaft connection – Important notes for the manufacturer / installer

Use of unsuitable damper shafts may damage the damper or damper shaft.

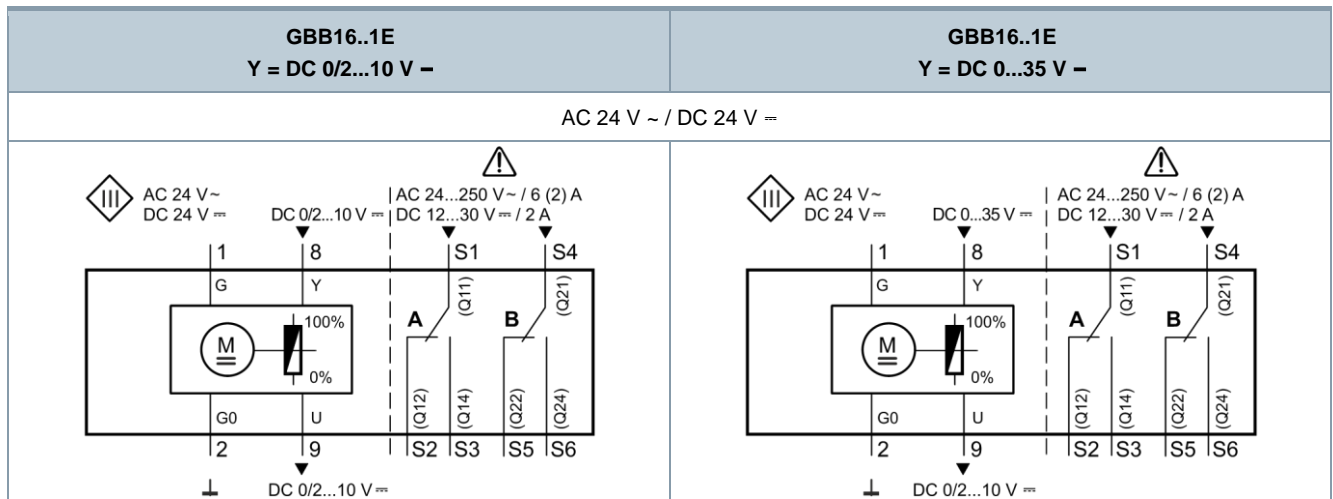
- Use only damper shafts with diameters suitable for the damper surface.
- Use only quality materials typical for the sector for damper shafts/rods.

Internal Diagrams

Open-close, 3-position control

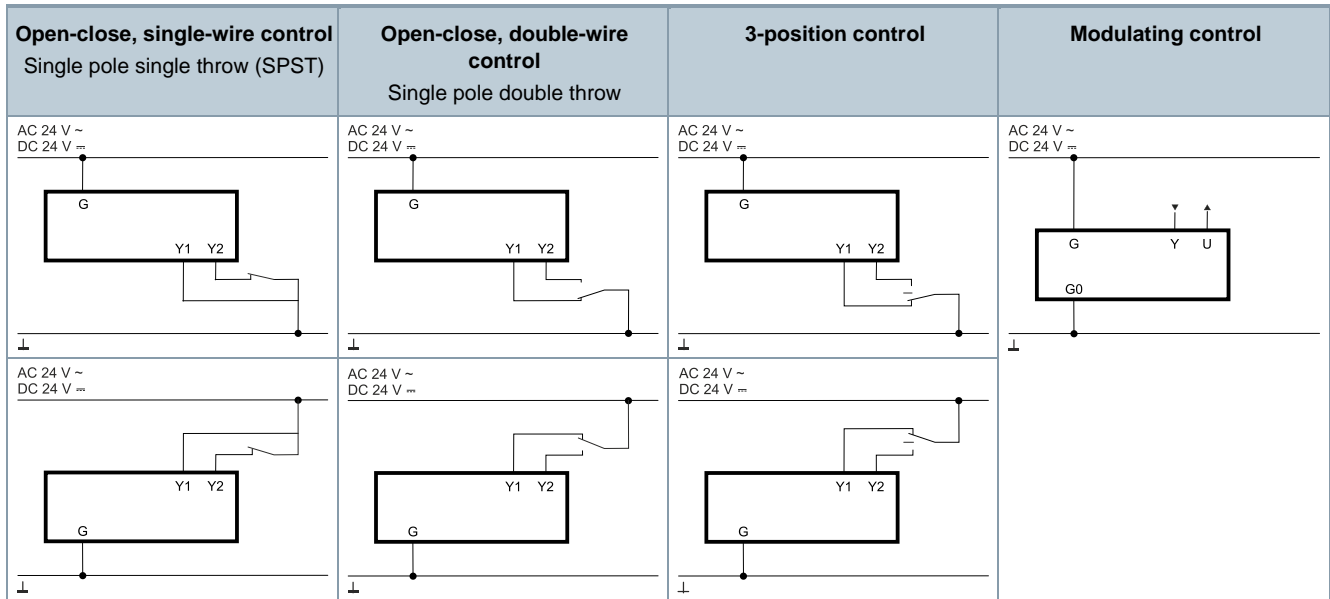


Modulating control

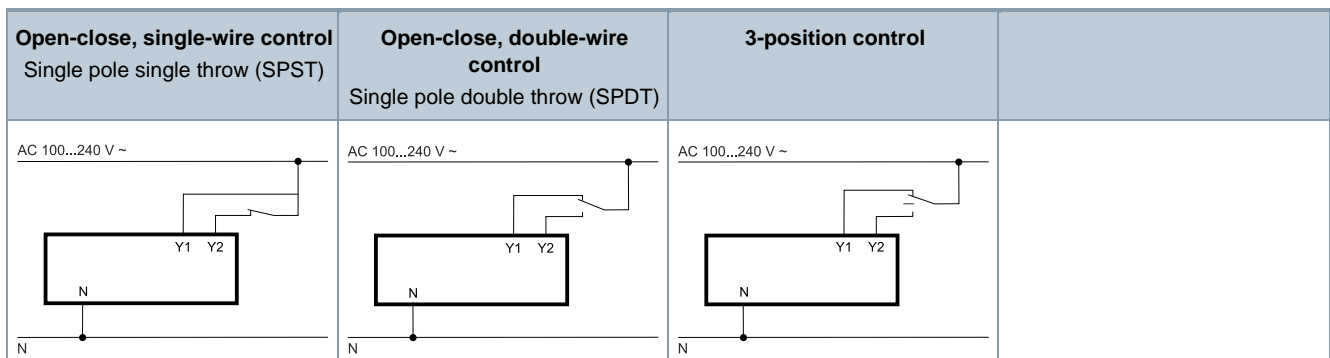


Connection diagrams

Control on GBB1..1E (AC 24 V ~ / DC 24 V –)



Control on GBB3..1E (AC 100...240 V ~)

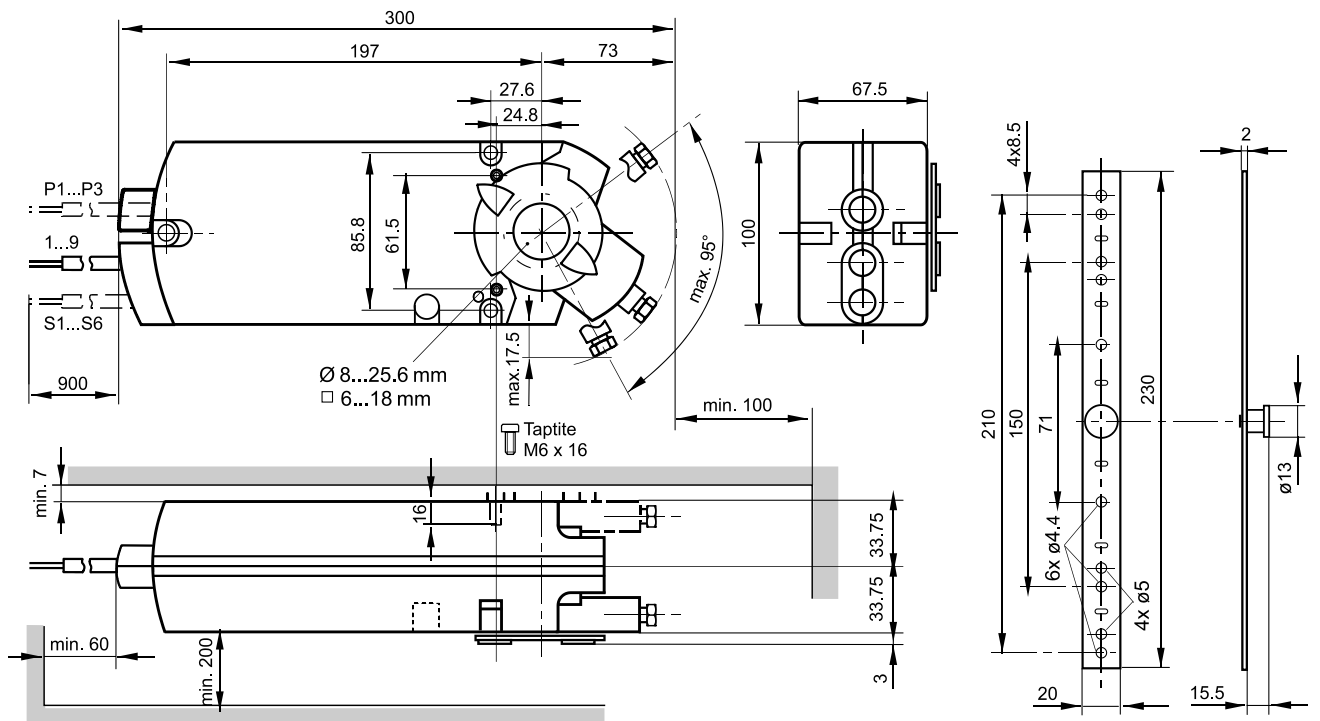


Cable designations

Connection	Code	No.	Color	Abbreviation	Meaning
Actuators AC 24 V ~ / DC 24 V –	G	1	red	RD	System potential AC 24 V ~ / DC 24 V –
	G0	2	black	BK	System zero
	Y1	6	purple	VT	Positioning signal AC/DC 0 V "clockwise" (GBB14..1E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V "counterclockwise" (GBB14..1E)
	Y	8	gray	GY	Signal input (GBB16..1E)
	U	9	pink	PK	Signal output (GBB16..1E)
Actuators AC 100...240 V ~	L	3	brown	BR	Phase AC 100...240 V ~
	N	4	light blue	BU	Neutral conductor
	Y1	6	black	BK	Positioning signal AC 100...240 V ~ "clockwise"
	Y2	7	white	WH	Positioning signal AC 100...240 V ~ "counterclockwise"

Feedback potentiometer	a	P1	white/red	WH RD	Potentiometer 0...100 % (P1-P2)
	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100...0 % (P3-P2)
Auxiliary switches	Q11	S1	gray/red	GY RD	Switch A input
	Q12	S2	gray/blue	GY BU	Switch A NC contact
	Q14	S3	gray/pink	GY PK	Switch A NO contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B NC contact
	Q24	S6	black/pink	BK PK	Switch B NO contact

Dimensions



Dimensions in mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
GBB141.1E S55499-D813	..A	GBB164.1E S55499-D818	..A
GBB145.1E S55499-D814	..A	GBB166.1E S55499-D819	..A
GBB146.1E S55499-D815	..A	GBB341.1E S55499-D820	..A
GBB161.1E S55499-D816	..A	GBB345.1E S55499-D821	..A
GBB163.1E S55499-D817	..A	GBB346.1E S55499-D822	..A