

## Analog Input Modules

## AGA56...

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Analog input modules for the control of SQM5... air damper actuators by continuous analog control signals, such as 4...20 mA, and continuous analog position feedback signals.

For supplementary Data Sheets, refer to SQM5... Data Sheet N7815 and ASZ... Data Sheet N7921.

**AGA56... and this Data Sheet are intended for use by OEMs which integrate the modules in their products!**

### Use

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The AGA56... are auxiliary modules for use with the SQM5... air damper actuators. They can be integrated into the SQM5... on site, or are supplied with the actuator, ready built in.

## Warning notes

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**To avoid injury to persons, damage to property or the environment, the following warning notes should be observed!**

### **Do not make any modifications to the modules!**

- All activities (mounting, installation and service work, etc.) must be carried out by qualified staff
- Before performing any wiring changes in the connection area, completely isolate the burner control from the mains supply (all-polar disconnection)
- Ensure protection against electric shock hazard by providing adequate protection for the burner control's connection terminals
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring is in an orderly state
- In the event of failure, the input modules do not offer intrinsic safety. Hence, depending on the application and the requirements, adequate safety measures outside the modules must be taken

## Mounting notes

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- Ensure that the relevant national safety regulation are complied with

## Installation notes

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- When making the wiring, ensure that AC 230 V mains voltage is strictly separated from protective low-voltage

## Standards and certificates

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Note!  
Only in connection with actuators!



EAC Conformity mark (Eurasian Conformity mark)



ISO 9001:2008  
ISO 14001:2004  
OHSAS 18001:2007

## Disposal notes

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The unit contains electrical and electronic components and must not be disposed of together with household waste.  
Local and currently valid legislation must be observed.

Type summary (other types of modules on request)

Functions	Control inputs	Position feed-back signal	Operating voltage (50...60 Hz)	Type reference	Identification letter <sup>1)</sup>
Manual control	---	---	AC 24...240 V	AGA56.1A97	A
Adjustment of control range Manual control	4...20 mA	---	AC 100...110 V	AGA56.41A17	G
			AC 220...240 V	AGA56.41A27	G
			AC 24 V	AGA56.41A87	G
	DC 0...2 V in connection with 0...135 Ω potentiometers (balance relay) up to 0...1000 Ω <sup>2)</sup>	---	AC 100...110V	AGA56.42A17	H
			AC 220...240 V	AGA56.42A27	H
			AC 24 V	AGA56.42A87	H
	DC 0...10 V	---	AC 100...110 V	AGA56.43A17	K
			AC 220...240 V	AGA56.43A27	K
			AC 24 V	AGA56.43A87	K
Adjustment of control range Linearization of angle of rotation Readjustment of control signal Presetting of fixed position Manual control	0...20 mA	0...20 mA	AC 100...110 V	AGA56.9A17	Z
	4...20 mA	4...20 mA	AC 220...240 V	AGA56.9A27	Z
	DC 0...10 V	DC 0...10 V	AC 24 V	AGA56.9A87	Z
	DC 0...2 V in connection with 0...135 Ω potentiometers (balance relay) up to 0...1000 Ω <sup>2)</sup>				

<sup>1)</sup> Type suffix (6th digit after the dot)

<sup>2)</sup> Any intermediate range possible

Ordering

Supply of input module and potentiometer:

- Integrated in the SQM5...	Part of type reference of the SQM5... Identification letter and identification number (refer to «Type summary»)
- As an individual item	Type reference of input module and potentiometer (refer to «Type summary» and «Accessories»)

Accessories

Potentiometers

Every input module requires **one** potentiometer.

	Type reference	Identification number <sup>*</sup> )
1000 Ω / 90° / conductive plastic	ASZ12.803	3
1000 Ω / 135° / conductive plastic	ASZ12.833	4
1000 Ω / 1000 Ω / 90° / conductive plastic	ASZ22.803	7
1000 Ω / 1000 Ω / 135° / conductive plastic	ASZ22.833	8

<sup>\*</sup>) Type suffix (7th digit after the dot)

## Technical data

General data	Type reference	Operating voltage
	- ...A27	AC 220 V –15 %...AC 240 V +10 %
	- ...A17	AC 100 V –15 %...AC 110 V +10 %
	- ...A87	AC 24 V –15 % / +10 %
	- ...A97	AC 24 V –5 %... AC 240 V +10 %
	Frequency	50...60 Hz ±6 %
	Degree of protection	IP 54 to IEC 529, when mounted in the SQM5...
	Safety class	to IEC 730-1, when mounted in the SQM5...
	- AGA56...A17, ...A27	I
	- AGA56...A87	III
	Input resistance	
	- Current input	≤ 300 Ω
	- Voltage input	≥ 100 kΩ
	Power consumption	2.8 VA (without actuator)
	Vibrations	30 m/s <sup>2</sup> (3 g) to IEC 68-2-6
	Vibration range	2...100 Hz
	Perm. input line lengths	≤ 100 m
	Temperature drift of output signals	≤ 2.5 % referred to entire ambient temperature range
	Weight	approx. 330 g
	Perm. loading on outputs	
	- Current output	short-circuit-proof to IEC 381
	- (Current) total load	max. 600 Ω
	- Voltage output	≥ 1.5 kΩ
	- Total load	all simultaneously to IEC 381
	DC current signals	to IEC 381 T1
	DC voltage signals	to IEC 381 T2
	<b>For assignment of connection terminals and further specification of the inputs and outputs, refer to «Assignment of terminals / Legend»</b>	
Environmental conditions	<b>Storage</b>	DIN EN 60 721-3-1
	Climatic conditions	class 1K3
	Mechanical conditions	class 1M2
	Temperature range	-20...+60 °C
	Humidity	< 95 % r.F.
	<b>Transport</b>	DIN EN 60 721-3-2
	Climatic conditions	class 2K2
	Mechanical conditions	class 2M2
	Temperature range	-30...+60 °C
	Humidity	< 95 % r.h., Climate F to DIN 40 040
	<b>Operation</b>	DIN EN 60 721-3-3
	Climatic conditions	class 3K5
	Mechanical conditions	class 3M2
	Temperature range	-20...+60 °C
	Humidity	of SQM5... with AGA56... build in < 95 % r.h., Climate F to DIN 40 040



**Condensation, formation of ice and ingress of water are not permitted!**

## Function

The following functions are provided:

- Manual control
- Adjustment of the control range
- Linearization of the angle of rotation
- Readjustment of the control signal
- Presetting the fixed position

(For availability, refer to «Type summary / Functions»)

### Manual control

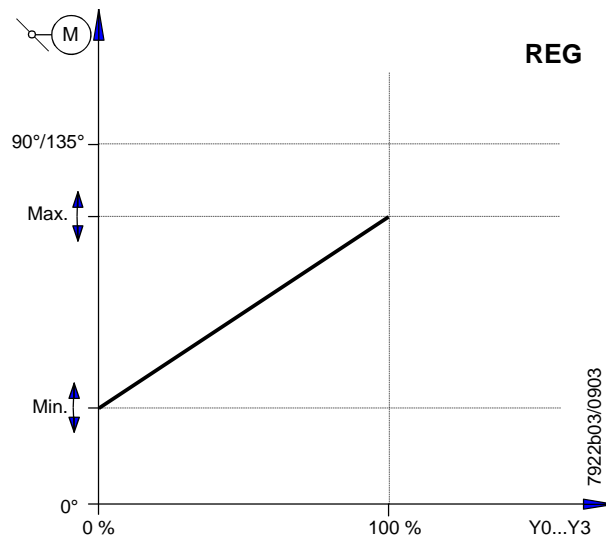
After operating the «MAN./AUTO.» switch and changing from «AUTO» to «MAN», the actuator can be opened or closed with the «▲/0/▼» toggle switch.

### Adjustment of the control range

Using the two potentiometers «MIN» and «MAX», the actuator's working range can be limited to between 0° and 90° or 135°.

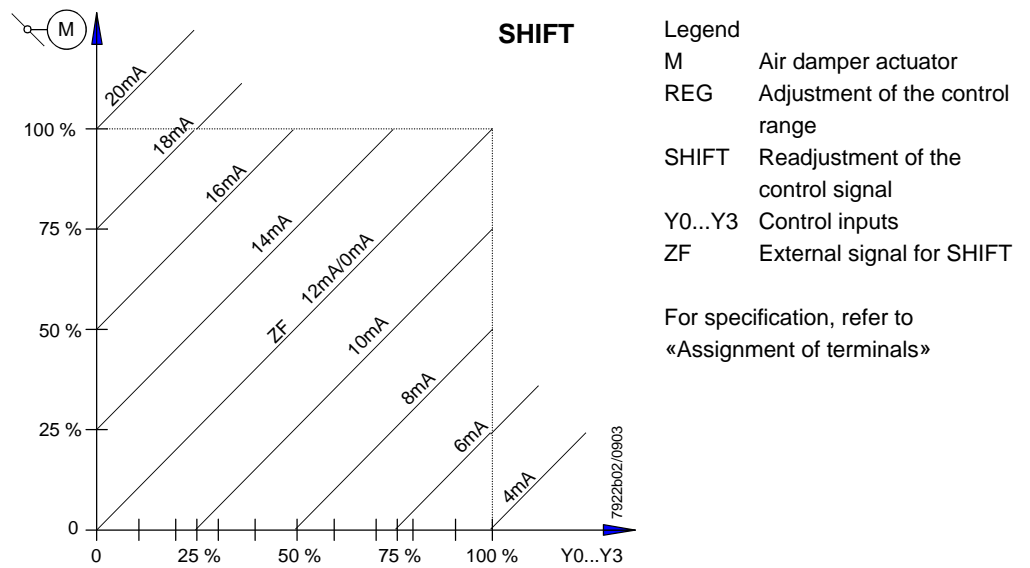
Adjusting the limitations

- Set switch «S1» to «MIN»
  - Set «MIN» potentiometer to a position between 0° and 67.5° or 101°
  - Set switch «S1» to «MAX»
  - Set «MAX» potentiometer to a position between the previously set «MIN» angle and 90° or 135°
- The «MAX» angle value must be greater than the «MIN» angle value!**
- Set switch «S1» to «OPE». In operation, switch «S1» must be in position «OPE»



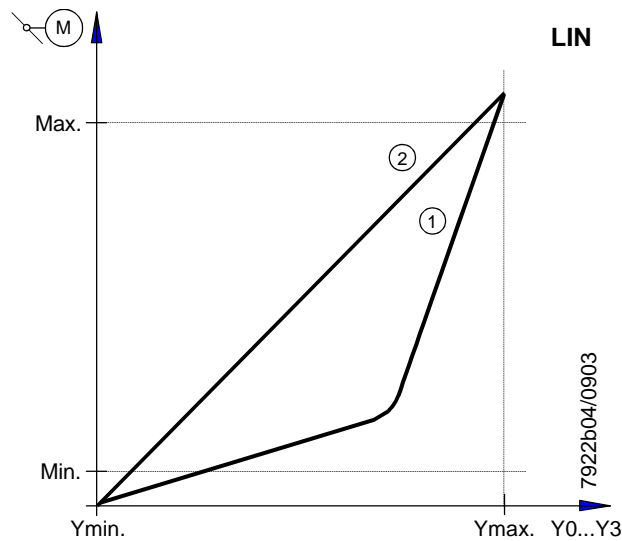
**Readjustment of the control signal**

The control signal can be readjusted using the external «ZF» signal (4...20 mA).



**Linearization of the angle of rotation**

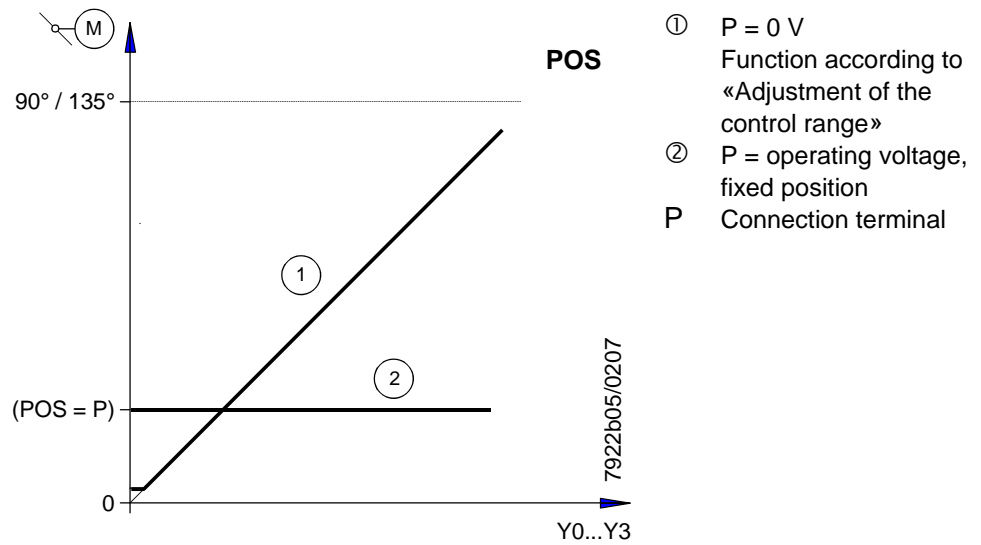
By setting shorting plug «J1» to position «1», the proportional behavior of the actuator (curve ②) can be matched to the control (curve ①). In the case of small signals, linearization of the angle of rotation produces over proportionally small angular changes and, in the case of greater signal, over proportionally large angular changes. Used in connection with non-linear regulating units, such as air dampers.



**Function (cont'd)**

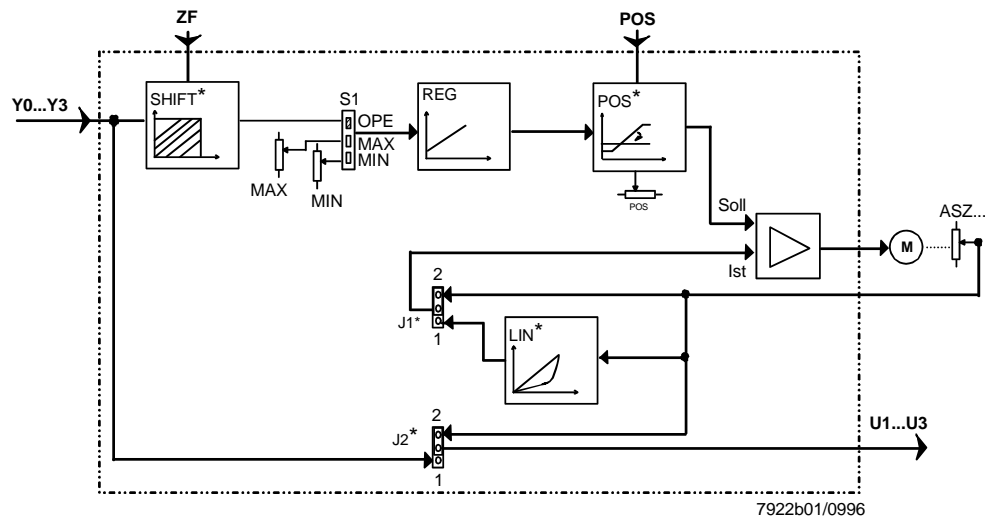
**Presetting the fixed position**

Using potentiometer «POS», the actuator's angular position can be preset. This position is approached independent of control signals when operating voltage is present at the input of «POS» (Terminal «P»). Position «POS» can be adjusted within the entire range of angular rotation.



Basic circuit diagram general valve data

**Basic circuit diagram**



**\* Only contained in the AGA56.9...!**

**Legend**

ASZ...	Potentiometer	POS	Preset fixed position
J1	Shorting plug	REG	Adjustment of the control range
J2	Shorting plug	S1	Switch
L	Live conductor	SHIFT	Readjustment of the control signal
LIN	Linearization of angle of rotation	U1...U3	Control outputs
M	Air damper actuator	Y0...Y3	Control inputs
OPE	Operating position	ZF	External signal for SHIFT

## Assignment of terminals

	Safety extra low-voltage terminals	Operating voltage terminals	
AGA56.9...			Screw terminals for single-wire cables up to 2.5 mm <sup>2</sup> (AWG12)
AGA56.41...			Terminals to RAST5 standard, also suited for use with quick connectors to DIN 46 244-A 6.3-0.8
AGA56.42...			Terminals to RAST5 standard, also suited for use with quick connectors to DIN 46 244-A 6.3-0.8
AGA56.43...			Terminals to RAST5 standard, also suited for use with quick connectors to DIN 46 244-A 6.3-0.8

Legend	A	Signal for opening the actuator → Limited by end switch in the SQM5...
	L	Live conductor
	L1, LR	Enabling control
	M	Ground
	N	Neutral conductor
	P	Positioning signal
	U, U4	Constant power supply DC 2 V for external potentiometer 135 Ω...1 kΩ, e.g. in connection with a balance relay system
	U1	Control output DC 0...10 V
	U2	Control output 0...20 mA
	U3	Control output 4...20 mA
	Yo	Control input DC 0...2 V from external potentiometer 135 Ω...1 kΩ, e.g. in connection with a balance relay system
	Y1	Control input DC 0...10 V
	Y2	Control input 0...20 mA
	Y3	Control input 4...20 mA
	Y+	Control input +pole

Y-	Control input -pole
Y	AGA56.42...: same as Yo AGA56.43...: same as Y1
Z, 13	Signals for closing the actuator, «CLOSED» position limited by end switch in the SQM5..., 2 parallel inputs for - signal from the burner control and - feedback of the AGA56...-internal control signal «ZL» (link ZL → 13) <u>Use:</u> Air damper does not close when burner is «OFF», that is, when «Ignition position» corresponds to the «CLOSED» position. Ends of output cables no. 3 and no. 13 must be stripped
ZF	Control input 4...20 mA for readjustment of the control signal
ZL	Signal for closing the actuator → Limited by auxiliary switch in the SQM5... <u>Example:</u> ignition load

Following applies to AC 24 V versions:

Go = N = M  
G = L

Signals and power supply with **operating voltage**  
A, L, Z, ZL, 13, L1, P, LR

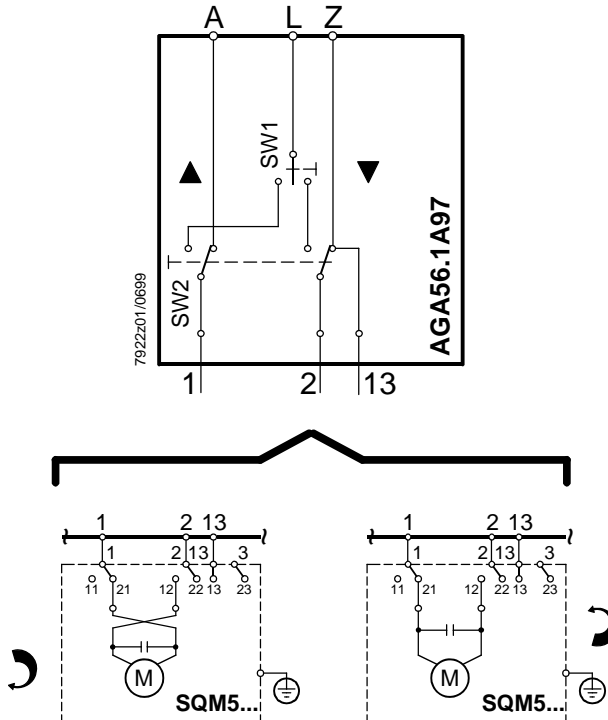


The following signals must not be present at the same time:

- L1, LR with A, Z, ZL or 13
- A with Z, ZL or 13

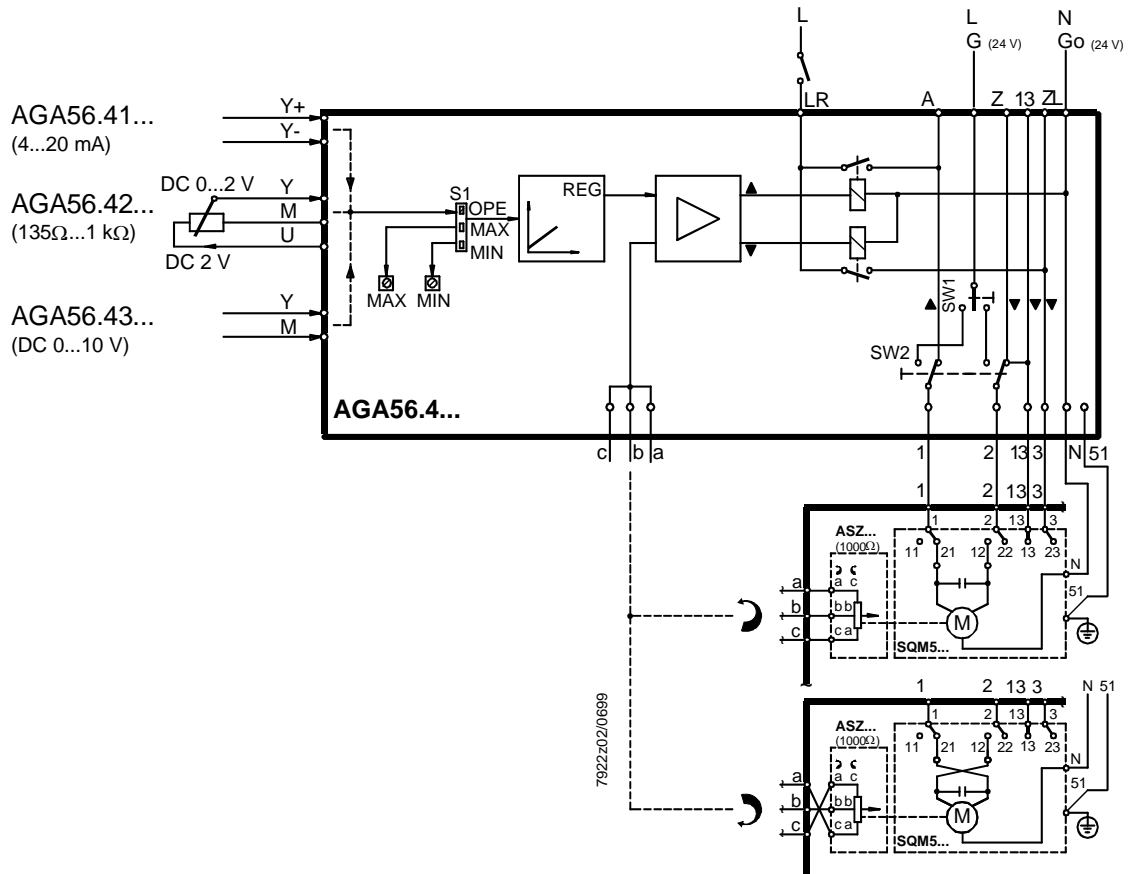


- Manual control



- Manual control
- Adjustment of the control range

...A87 : DC 24 V / 50...60 Hz  
 ...A27 : AC 220...240 V / 50...60 Hz  
 ...A17 : AC 100...110 V / 50...60 Hz

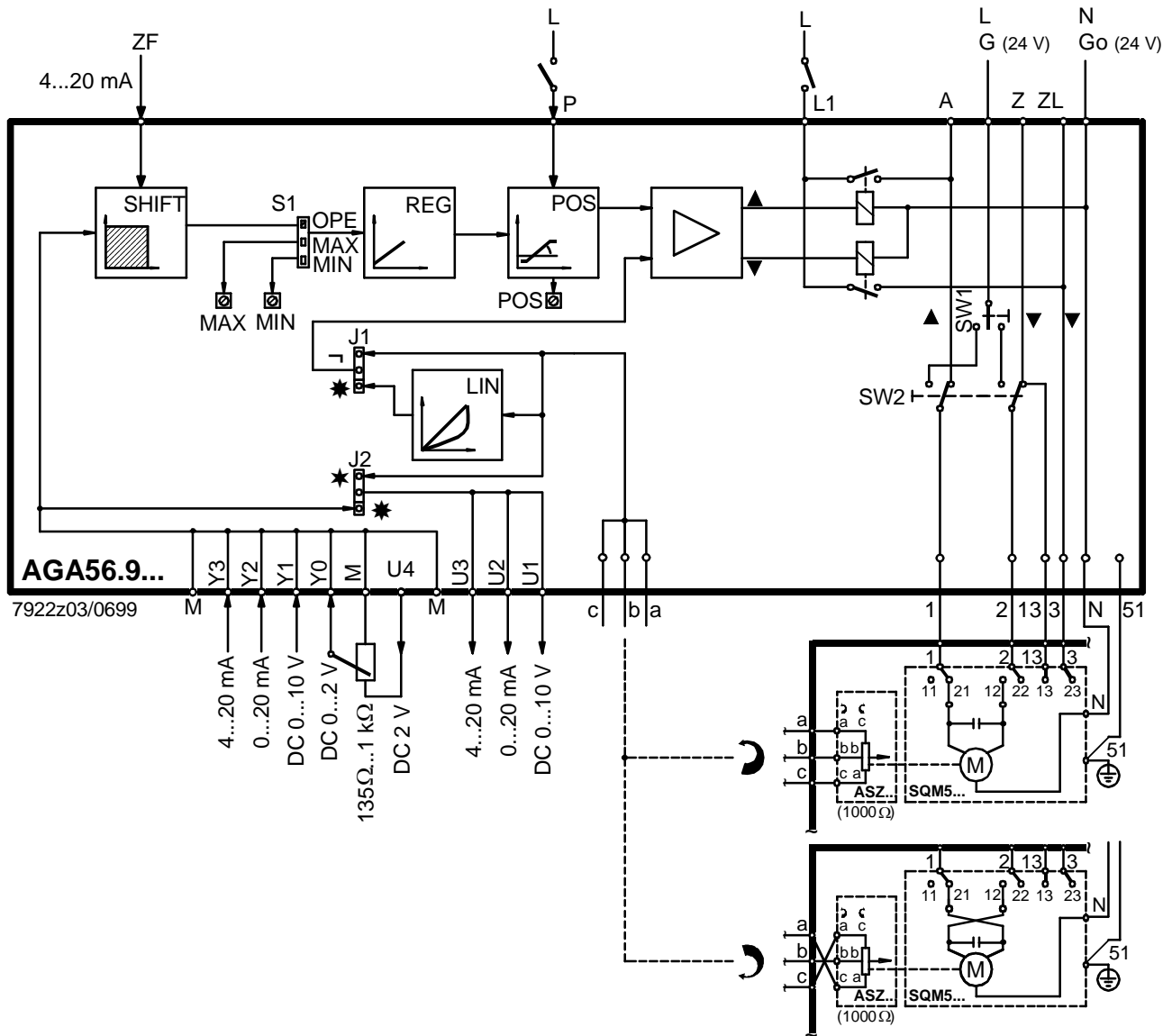


Internal diagrams and connection diagrams (cont'd)

AGA56.9...

- Manual control
- Adjustment of the control range «REG»
- Readjustment of the control signal «SHIFT»
- Linearization of the angle of rotation «LIN»
- Presetting the fixed position «POS»

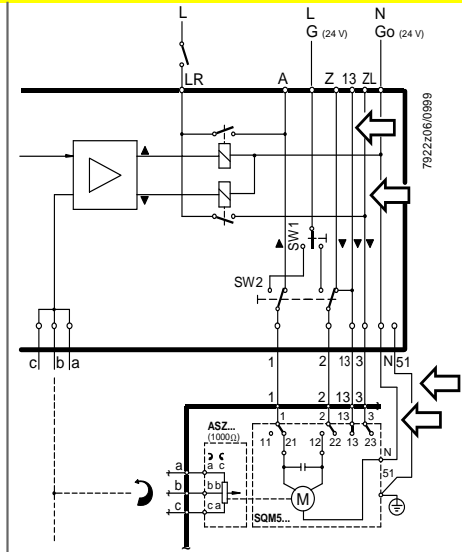
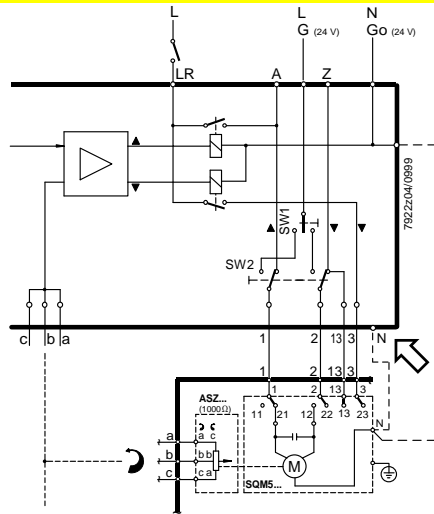
...A87 : DC 24 V / 50...60 Hz  
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 ...A17 : AC 100...110 V / 50...60 Hz



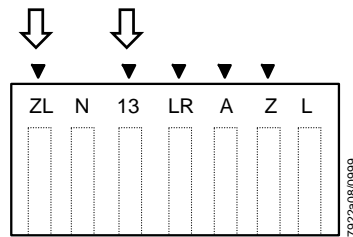
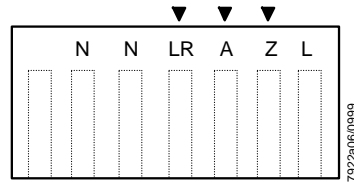
⬇ Please note

**Executions supplied until end of 1999**      **Current execution**

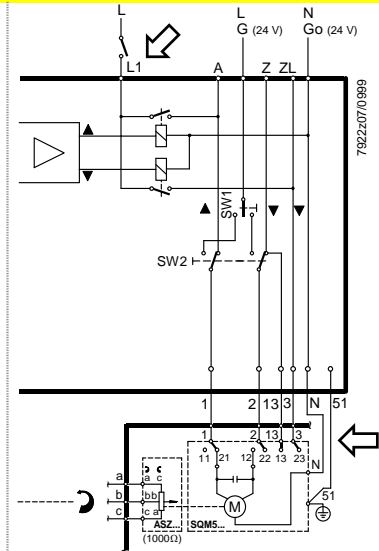
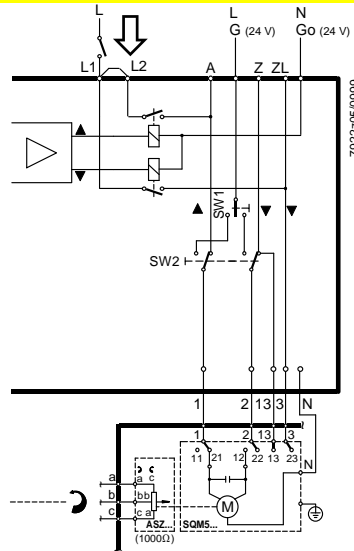
AGA56.41...  
AGA56.42...  
AGA56.43...



Terminal assignment



AGA56.9...



Terminal assignment

