

## 2-port control ball valves for flanged connection, PN16

VAF41..



**For use in heating, ventilation and air conditioning systems as a control or shutoff valve.**

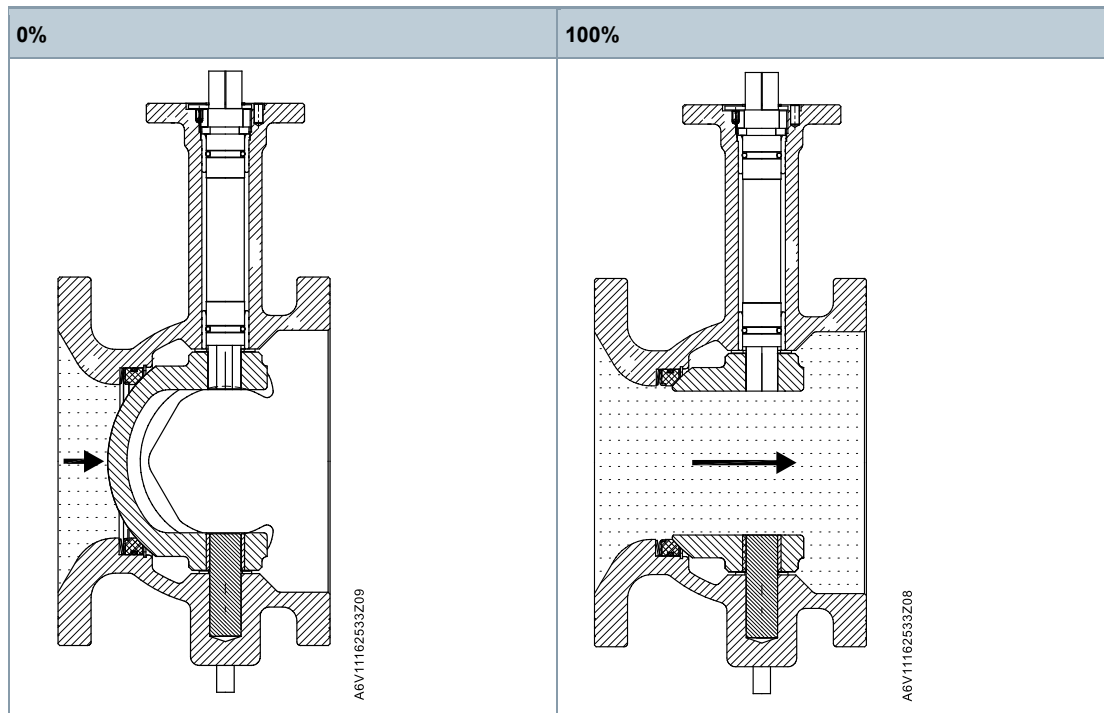
- Ductile iron, EN-GJS-450-10 (QT450) valve body
- DN 65...150
- $k_{vs}$  63...360 m<sup>3</sup>/h
- Angle of rotation 90°
- Flange connection to ISO 7005-2
- Used with rotary actuators GEB..1E and GIB..1E without spring return and GCA..1E with spring turn

## Use

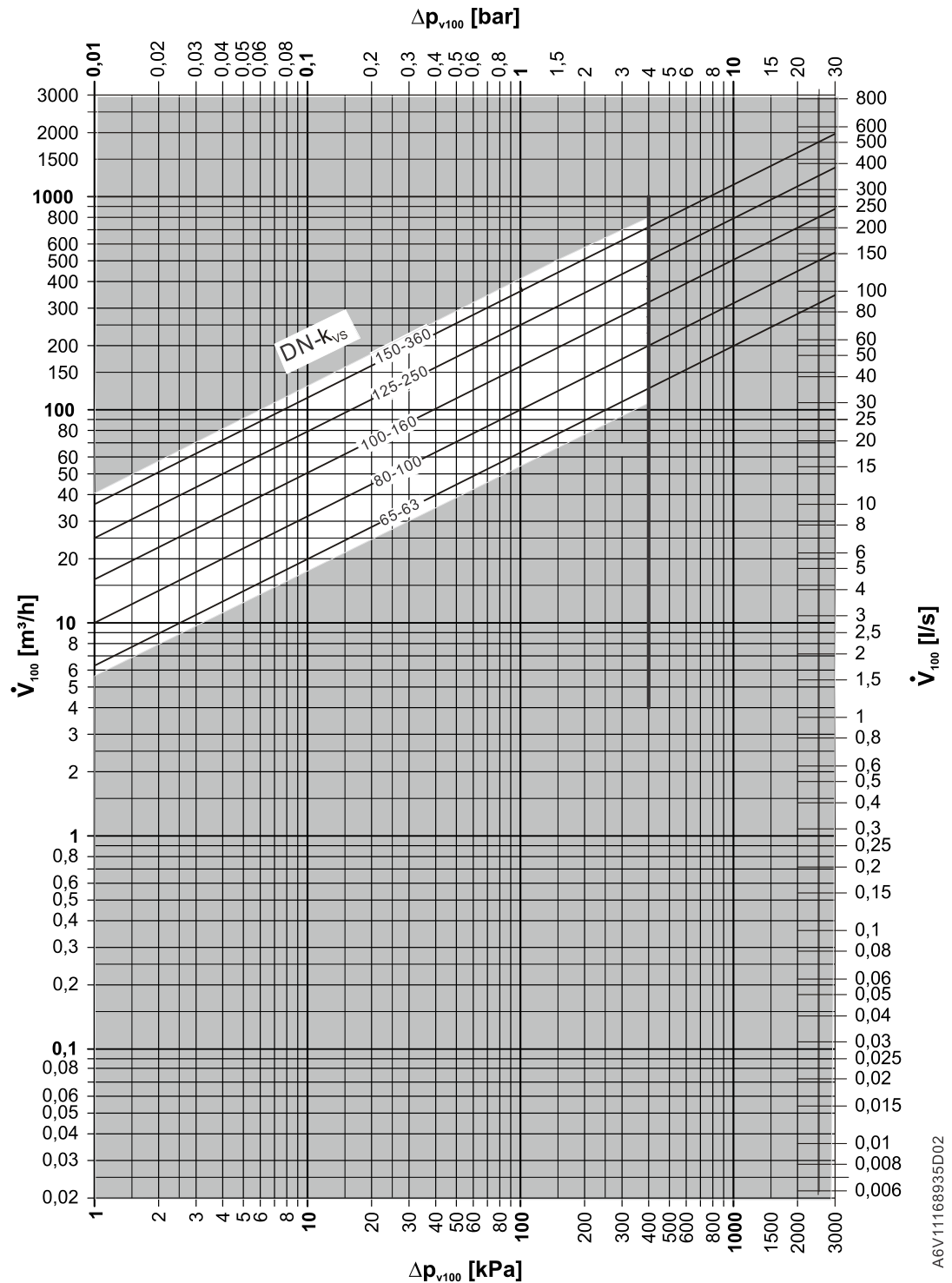
For use in heating, ventilation and air conditioning systems as a control or shutoff valve.  
For closed circuits of cooling water (Refer to **Cavitation**).

## Technical design

### Valve cross section



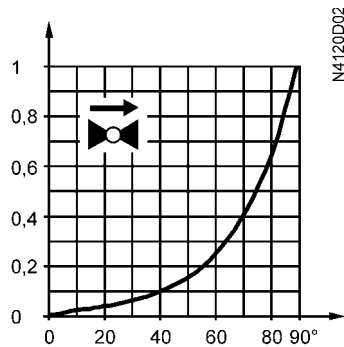
Flow diagram



- $\Delta p_{\text{max}}$  = Maximum permissible differential pressure across the valve, valid for the entire actuating range of the motorized valve. For low noise operation we recommend a maximum permissible differential pressure of 240 kPa
- $\Delta p_{v100}$  = Differential pressure across the fully open valve and the valve's control path by a volume flow  $V_{100}$
- $V_{100}$  = Volumetric flow through the fully open valve
- 100 kPa = 1 bar  $\approx$  10 mWC
- 1  $\text{m}^3/\text{h}$  = 0.278  $\text{l/s}$  water at 20 °C

A6V11168935D02

## Valve flow characteristic



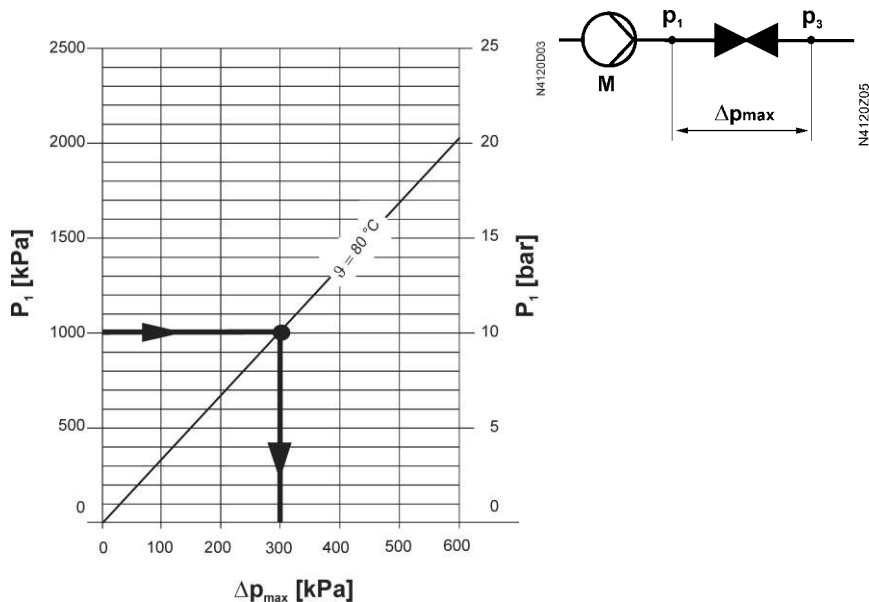
0...90 ° equal percentage  
 $n_{q1} = 3.0$  to VDI / VDE 2173

## Cavitation

Cavitation accelerates wear on the ball and seat, and also results in undesirable noise. Cavitation can be avoided by not exceeding the differential pressure shown in the **Flow diagram**, and by adhering to the static pressures shown below.

### Note on chilled water:

To avoid cavitation in chilled water circuits, please ensure sufficient counter pressure at valve outlet, e.g. by a throttling valve after the heat exchanger. Select the pressure drop across the valve at maximum according to the 80 °C curve in the flow diagram below.



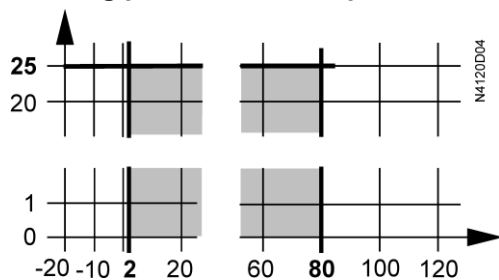
$\Delta p_{\max}$  = Differential pressure with valve almost closed, at which cavitation can largely be avoided

$p_1$  = Static pressure at inlet

$p_3$  = Static pressure at outlet

M = Pump

### Working pressure and temperature



Working pressure and medium temperature as per ISO 7005  
Current local legislation must be observed.

### Type summary

Product number	Stock number	DN	$K_{vs}$ [m³/h]	$S_v$
VAF41.65-63/2	S55232-V112	65	63	200
VAF41.80-100/2	S55232-V113	80	100	
VAF41.100-160/2	S55232-V114	100	160	
VAF41.125-250/2	S55232-V115	125	250	
VAF41.150-360/2	S55232-V116	150	360	

### Note:

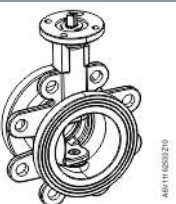
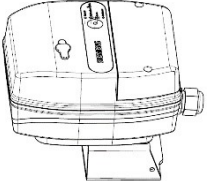
- DN = nominal size
- $K_{vs}$  = nominal flow rate of cold water (5...30 °C) through the fully open ball valve at a differential pressure of 100 kPa (1 bar)
- $S_v$  = rangeability  $k_{vs} / k_{vr}$
- $K_{vr}$  = smallest  $k_v$  value at which the flow characteristic tolerances can still be maintained at a differential pressure of 100 kPa (1 bar)

### Ordering

Ball valve, actuator must be ordered separately.

When ordering please specify the quantity, product name and type code.

Example:

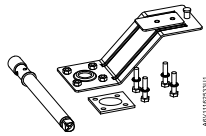
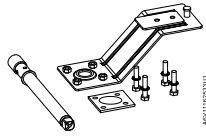
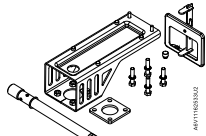
Product number	Stock number	Product content	Quantity
VAF41.100-160	S55232-V107	2-way ball valve 	2
GIB161.1E	GIB161.1E		2

## Delivery

- Ball valves and rotary actuators are packed and delivered separately.
- The ball valves are supplied without counter-flanges and flange gaskets.

## Accessories installations

- No extra purchase of separate mounting accessories when using SQL series, which are packaged and shipped in combination with actuators.
- Mounting accessories need to be purchased separately when using GEB, GIB, GCA series.

Mounting sets for		Product number	Stock number	Example
Valve	Actuator			
VAF41...65-63/2 VAF41.80-100/2	GEB..1E	ASK77.23	S55845-Z252	
VAF41...65-63/2 VAF41.80-100/2	GCA..1E	ASK77.21	S55845-Z203	
VAF41.100-160/2 VAF41.125-250/2	GIB..1E			
VAF41...150-360/2	2*GIB..1E	ASK77.22	S55845-Z204	

## Equipment combinations

Actuators	SQL331A00T20 SQL131A00T20 SQL161A00T20		SQL331A00T35 SQL131A00T35 SQL161A00T35		SQL331A00T50 SQL131A00T50 SQL161A00T50	
	$\Delta p_{\max}$	$\Delta p_s$	$\Delta p_{\max}$	$\Delta p_s$	$\Delta p_{\max}$	$\Delta p_s$
	[kPa]					
VAF41.65-63/2	400	400				
VAF41.80-100/2	400	400				
VAF41.100-160/2			400	400		
VAF41.125-250/2			400	400		
VAF41.150-360/2					400	400

### Note:

$\Delta p_{\max}$  = Maximum permissible differential pressure across valve's control path, valid for the entire actuating range of the motorized valve.

For low noise operation we recommend a maximum permissible differential pressure of 240 kPa.

$\Delta p_s$  = Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure).

## Actuator overview

Product type	ASN	Open circuit control	Operating voltage	Positioning signal input Y	Location pointer U = DC 0/2...10 V 4/0...20mA	Adaptive rotation Angular range	Rotary direction switch	Positioning time for 90° [s]
SQL331A00T20	S55164-A160	On-off/ 3-position	AC 230 V ~	-	-	-	-	30 s
SQL331A00T35	S55164-A161							
SQL331A00T50	S55164-A162							
SQL131A00T20	S55164-A163		AC 24 V ~ / DC 24 V =					
SQL131A00T35	S55164-A164							
SQL131A00T50	S55164-A165							
SQL161A00T20	S55164-A166	Modulating	AC 24 V ~ / DC 24 V =	DC 0/2...10 V 4/0...20 mA	√	√	√	
SQL161A00T35	S55164-A167							
SQL161A00T50	S55164-A168							

### Applications requiring accessibility or spring return

If auxiliary accessories or spring return are required to implement the corresponding function, such as auxiliary switches or potentiometers, the following products and mounting kits can be ordered. When mounting, follow the mounting instructions.

Actuators	Compatible valves	Options	Mounting kits
GEB..1E	VAF41.65-63/2 VAF41.80-100/2	Potentiometer, auxiliary switch	Mounting kits for ball valves ASK77.23
GIB..1E	VAF41.100-160/2 VAF41.125-250/2	Potentiometer, auxiliary switch	Mounting kits for ball valves ASK77.21
2*GIB..1E	VAF41.150-360/2	Potentiometer, auxiliary switch	Mounting kits for ball valves ASK77.22
GCA1..1E	VAF41.65-63/2 VAF41.80-100/2	Potentiometer, auxiliary switch	Mounting kits for ball valves ASK77.21

## ⚠ WARNING



**GIB33..1E and GIB13..1E actuator can't be used as on/off actuator.**  
Operating with 2-position signal will damage the rotary actuator.


## Product documentation

Topic	Title	Document ID
Mounting and installation	VAF41.. Mounting instructions	A5W90003152A
Environmental compatibility	Product environmental compatibility	A5W00291968A

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

[www.siemens.com/bt/download](http://www.siemens.com/bt/download)

## Security

<b>! CAUTION</b>	
	<b>National safety regulations</b> Failure to comply with national safety regulations may result in personal injury and property damage. <ul style="list-style-type: none"> <li>Observe national provisions and comply with the appropriate safety regulations.</li> </ul>

## Engineering

We recommend installing the ball valve in the return pipe, as the temperature is

- higher for application in cooling systems and
  - lower for applications in heating systems,
- which could extend the life of stem sealing gland.

Please ensure the flow is cavitation free (refer to Sizing [► 3]).

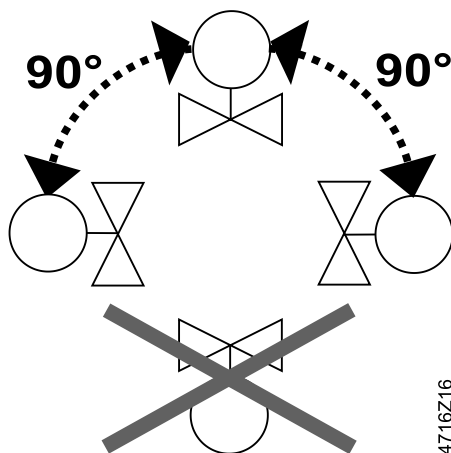
Please always install a strainer upstream of the valve to increase the valve's functional safety.

## Mounting

Both ball valve VAF41.. and actuator SQL..1A00T.., GEB..1E, GIB..1E and GCA..1E can easily be assembled on site. Normal tools and adjustment are required.

The valve is supplied with Mounting Instructions A6V11162533 (A5W90003152).


## Orientation



## Direction flow

Pay attention to the valve's flow direction symbol during mounting.

## Commissioning

<b>NOTICE</b>	
	<b>Commission the ball valve only if the rotary actuator has been mounted correctly.</b>

- Ball valve rotation counter clockwise: ball valve opens = increasing flow
- Ball valve rotation clockwise: ball valve closes = decreasing flow



## Maintenance

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VAF41.. ball valves with assembled rotary actuator require no maintenance.

### Warnings:

- When performing service work on the ball valve / rotary actuator:
  - Deactivate the pump and disconnected the pump power supply
  - Close the manual shutoff valves
- Fully release the pressure in the piping system and allow pipes to completely cool down.
- If necessary, disconnect the electrical wires of actuator before performing the service work.
- Before putting the ball valve into operation again, make sure the rotary actuator is correctly fitted.

## Disposal

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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](#).

## Warranty

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Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

<b>Functional data</b>	
PN class	PN 16 to ISO 7268
Working pressure	To ISO 7005 within the permissible "medium temperature" range according to the diagram in <b>Working pressure and temperature</b> .
Flow characteristic	Equal percentage; $n_{gl} = 3.0$ to VDI / VDE 2173 (modified)
Leakage rate	0...0.01% of $k_{vs}$ value
Permissible media	Cooling water, chilled water, low temperature hot water, water with anti-freeze; Recommendation: water treatment to VDI 2035
Medium temperature	2...80 °C
Rangeability $S_v$	$\geq 200$

<b>Materials</b>	
Valve body	Ductile iron, EN-GJS-450-10 (QT450)
Ball	Stainless steel (SS304)
Stem	Stainless steel (SS304)
Seat	PTFE
Sphere	Teflon with graphite
Gland materials	EPDM O-rings

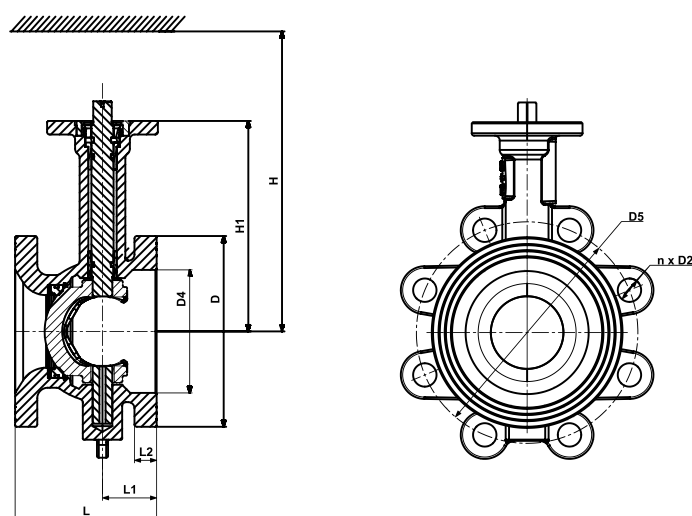
<b>Norms and standards</b>	
Environmental compatibility	The product environmental declaration A5W00291968A contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

<b>General ambient conditions</b>			
	Operation EN 60721-3-3	Transport EN 60721-3-2	Storage EN 60721-3-1
Environmental conditions	Class 3k5, Extended 3z11	Class 2K2, 2M2	Class 1K3
Temperature	-15...+55 °C	-30...+65 °C	-15...+50 °C
Humidity	5...95% r. h.	<95% r. h.	5...95% r. h.

<b>Dimensions/weight</b>
Refer to Dimensions [► 11] below.

## Dimensions

Dimensions in mm



- DN = Nominal size
- H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.
- H1 = Dimension from the pipe centre to install the actuator (upper edge)

A6V116253M01

Type		DN	L [mm]	L1 [mm]	L2 [mm]	D ø [mm]	n	D2 ø [mm]	D4 ø [mm]	D5 ø [mm]	H	H* [mm]	H1 [mm]	kg [kg]
Valve	Actuator													
VAF41.65-63/2	SQL331A00T20	65	90	36	16	118	4	19	65	145	> 510	> 550	153	6.98
VAF41.80-100/2	SQL131A00T20 SQL161A00T20	80	98	38	16	135	8	19	80	160	> 520	> 560	161	8.28
VAF41.100-160/2	SQL331A00T35	100	115	44	18	155	8	19	100	180	> 530	> 570	171	10.48
VAF41.125-250/2	SQL131A00T35 SQL161A00T35	125	133	51	19	185	8	19	125	210	> 540	> 590	186	13.48
VAF41.150-360/2	SQL331A00T50 SQL131A00T50 SQL161A00T50	150	156	60	19	211	8	23	150	240	> 550	> 680	205	17.68

\*: Suitable for mounting height when ASK77.2x adaptor is installed in combination with GEB, GIB or GCA.

## Revision numbers

Type	Valid from rev. no.
VAF41.65-63/2	...A
VAF41.80-100/2	...A
VAF41.100-160/2	...A
VAF41.125-250/2	...A
VAF41.150-360/2	...A