

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.

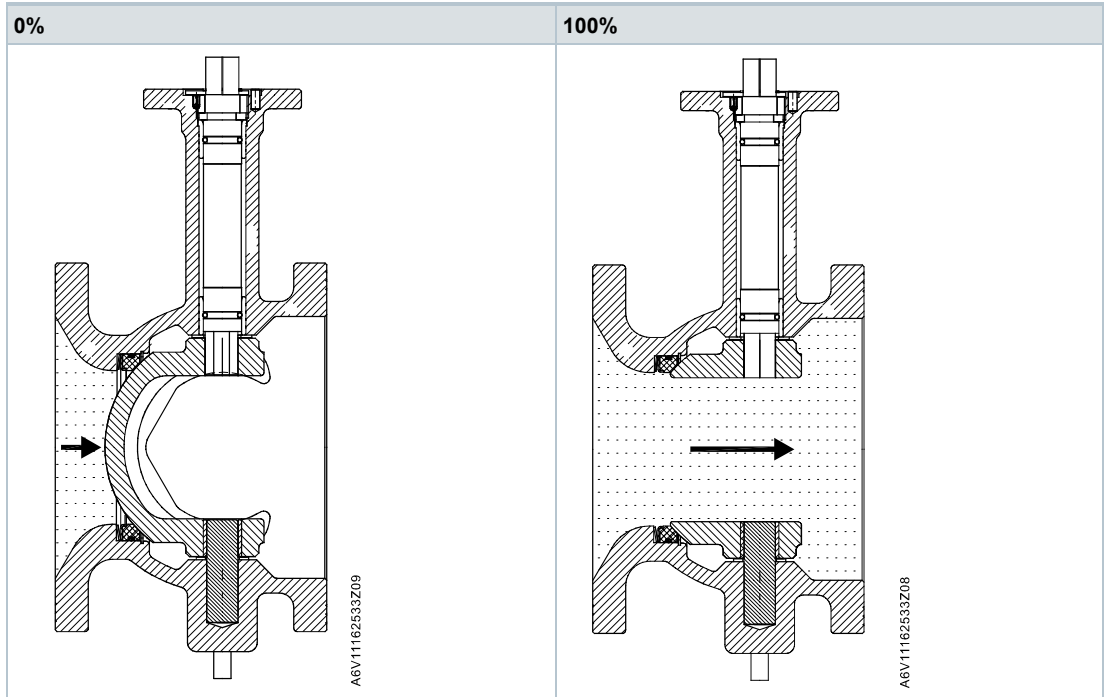
- Ductile iron, EN-GJS-450-10 (QT450) valve body
- DN 65...150
- k_{vs} 63...360 m³/h
- Angle of rotation 90°
- Flange connection to ISO 7005-2
- Used with rotary actuators GEB..1E and GIB..1E without spring return and GCA..1E with spring turn

Use

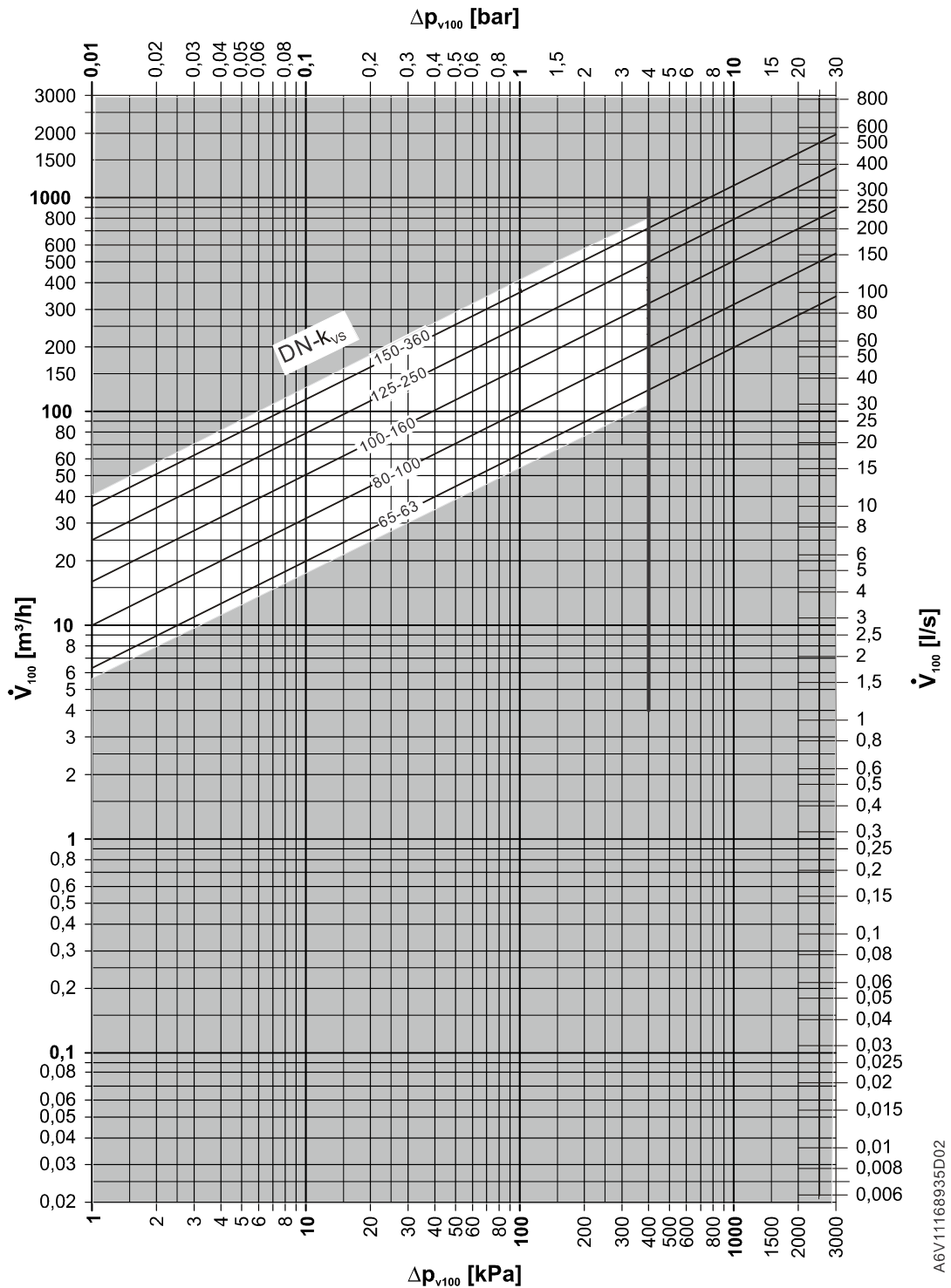
For use in heating, ventilation and air conditioning systems as a control or shutoff valve.
For closed circuits of cooling water (Refer to **Cavitation**).

Technical design

Valve cross section



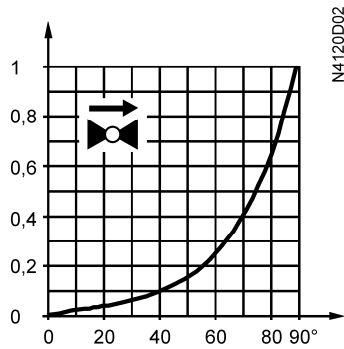
Flow diagram



- Δp_{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
- Δp_{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 m³/h = 0.278 l/s water at 20 °C

A6V11168935D02

Valve flow characteristic



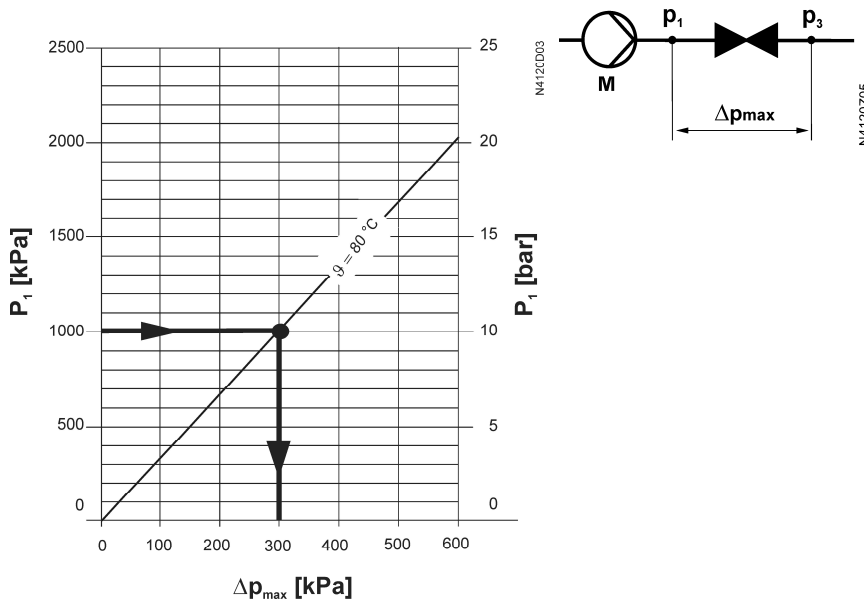
0...90 ° equal percentage
 $n_{q1} = 3.0$ to VDI / VDE 2173

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.



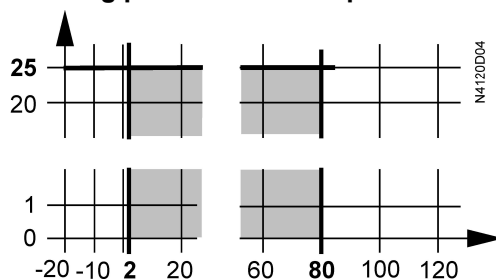
Δp_{max} = Differential pressure with valve almost closed, at which cavitation can largely be avoided

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} [m ³ /h]	S _v
VAF41.65-63/1	S55232-V110	65	63	200
VAF41.80-100/1	S55232-V111	80	100	
VAF41.100-160	S55232-V107	100	160	
VAF41.125-250	S55232-V108	125	250	
VAF41.150-360	S55232-V109	150	360	

Note:

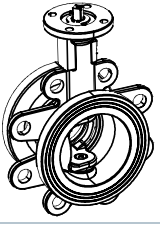
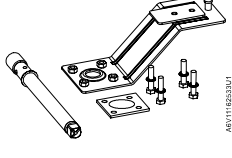
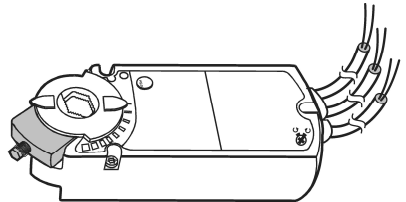
- DN = nominal size
- K_{vs} = nominal flow rate of cold water (5...30 °C) through the fully open ball valve at a differential pressure of 100 kPa (1 bar)
- S_v = rangeability kvs / kvr
- K_{vr} = smallest kv value at which the flow characteristic tolerances can still be maintained at a differential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

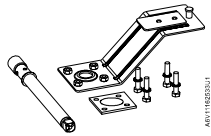
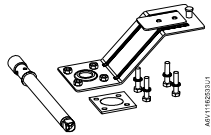
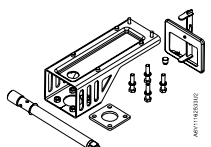
Example:

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

Delivery

- Ball valve and its related mounting sets are packed together.
- Ball valves and rotary actuators are packed and delivered separately.
- The ball valves are supplied without counter-flanges and flange gaskets.

Spare parts

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

Equipment combinations

Actuators	GEB..1E		GCA..1E		GIB..1E		2*GIB..1E	
Additional mounting set	1)		ASK77.21		1)		1)	
Ball valves	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
	[kPa]							
VAF41.65-63/1	400	400	400	400				
VAF41.80-100/1	400	400	400	400				
VAF41.100-160					400	400		
VAF41.125-250					400	400		
VAF41.150-360							400	400

1) No need of additional mounting set. Mounting sets are enclosed with ball valve packages.

Note:

Δp_{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.

Δp_s = Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure).

Actuator overview

Type	Stock number	Open-loop control	Operating voltage	Positioning signal input Y	Position indicator U = DC 0...10V \Rightarrow	Feedback potentiometer	Auxiliary switch	Rotation direction switch		
GEB141.1E	S55499-D329	2- or 3-position	AC 24 V ~ / DC 24...48 V \Rightarrow	-	-	-	-	Yes		
GEB142.1E	S55499-D330					5 k Ω	-			
GEB146.1E	S55499-D331					-	2			
GEB341.1E	S55499-D336					AC 100...240 V ~	-			
GEB346.1E	S55499-D337						2			
GEB161.1E	S55499-D332	Modulating	AC 24 V ~ / DC 24...48 V \Rightarrow	DC 0/2...10 V \Rightarrow	Yes	-	-	Yes		
GEB163.1E	S55499-D333								DC 0...35 V \Rightarrow	
GEB164.1E	S55499-D334								DC 0/2...10 V \Rightarrow	2
GEB166.1E	S55499-D335									-
GEB361.1E	S55499-D338								AC 100...240 V ~	-
GIB131.1E	GIB131.1E	3-position	AC 24 V ~	-	-	-	-	-		
GIB135.1E	GIB135.1E					1 k Ω	2			
GIB136.1E	GIB136.1E					-	2			
GIB331.1E	GIB331.1E					AC 230 V ~	-			
GIB335.1E	GIB335.1E						1 k Ω		2	
GIB336.1E	GIB336.1E						-		-	
GIB161.1E	GIB161.1E						Modulating		AC 24 V ~	DC 0...10 V \Rightarrow
GIB163.1E	GIB163.1E	DC 0...35 V \Rightarrow								
GIB164.1E	GIB164.1E	DC 0...10 V \Rightarrow	2							
GIB166.1E	GIB166.1E		-							
GCA131.1E	GCA131.1E	3-position	AC 24 V ~ / DC 24...48 V \Rightarrow	-	-	-	-	-		
GCA135.1E	GCA135.1E					1 k Ω	2			
GCA161.1E	GCA161.1E	Modulating		DC 0...10 V \Rightarrow	Yes	-	-	2		
GCA163.1E	GCA163.1E								DC 0...35 V \Rightarrow	
GCA164.1E	GCA164.1E								DC 0...10 V \Rightarrow	
GCA166.1E	GCA166.1E									-



⚠ WARNING

GEB341.1E, GEB14..1E, GIB33..1E and GIB13..1E, GCA13..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	A5W90003152
Data sheet	VAF41.. Data sheet	A6V11168935
Environmental compatibility	Product environmental compatibility	A5W90003652

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

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

Security

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

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]).

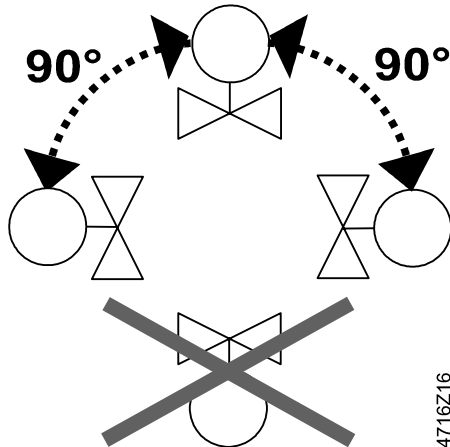
Please always install a strainer upstream of the valve to increase the valve's functional safety.

Mounting

Both ball valve VAF41.. and rotary actuator GEB..1E, GIB..1E or 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

	NOTICE
	Commission the ball valve only if the rotary actuator has been mounted correctly.

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

Maintenance

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

The valve should not be disposed of as domestic garbage.

- Special treatment for individual components may be required by law or make ecological sense.
- Comply with all local and currently applicable laws and regulations.

Warranty

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.

Technical data

Functional data	
PN class	PN 16 to ISO 7268
Working pressure	To ISO 7005 within the permissible "medium temperature" range according to the diagram in Working pressure and temperature .
Flow characteristic	Equal percentage; $\eta_{gl} = 3.0$ 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	≥ 200

Materials	
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

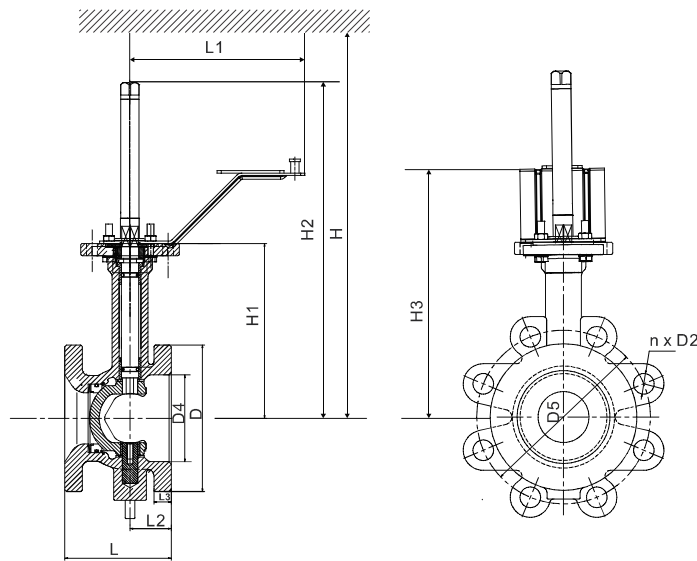
Norms and standards	
Environmental compatibility	The product environmental declaration A5W90003652 contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

General ambient conditions			
	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.

Dimensions/weight	
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)
- H2 = Dimension from the pipe center to the top of the shaft

Type		DN	L	L1	L2	L3	D	n	D2	D4	D5	H	H1	H2	H3	[kg]
Valve	Actuator		[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]
VAF41.65-63/1	GEB..1E	65	90	150	36	16	118	4	19	65	145	> 550	153	331	226	5.8
VAF41.80-100/1		80	98	150	38	16	135	8	19	80	160	> 560	161	339	234	7.1
VAF41.65-63/1	GCA..1E (ASK77.21)	65	90	207	36	16	118	4	19	65	145	> 550	153	351	246	5.8
VAF41.80-100/1		80	98	207	36	16	135	8	19	80	160	> 560	161	359	254	7.1
VAF41.100-160	GIB..1E	100	115	207	44	18	155	8	19	100	180	> 570	171	369	264	9.1
VAF41.125-250		125	133	207	51	19	185	8	19	125	210	> 590	186	384	279	12.3
VAF41.150-360	2*GEB..1E	150	156	229	60	19	211	8	23	150	240	> 680	205	478	303	16.9

Revision numbers

Type	Valid from rev. no.
VAF41.65-63/1	..A
VAF41.80-100/1	..A
VAF41.100-160	..B
VAF41.125-250	..B
VAF41.150-360	..B

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