V295

Compensated Two-way Piston Valve
Nodular Iron, PN 25 (362 psi)

F-20-11

2001-11-14

– V295 is a two-way piston valve with flanged ends
– The valve is balanced (pressure-compensated), thereby requiring a low actuating force.

APPLICATION

The valve is primarily intended to be used in heating, air conditioning and district heating installations with large pressure drops.

For other types of applications, please contact your nearest TAC sales office.

The V295 valve can be used with the following types of fluids:

– hot water, or deaerated cooling water.
– water with additives such as phosphate or hydrazine.
– deaerated water with glycol-type antifreeze agent (max. 50%), and brines (special packing box required, see "SPARE PARTS").
– with cooling medias at temperatures below 0 °C a stem heater must be fitted, to protect from stem seizure due to freezing.

TECHNICAL DATA

Valve type ..... 2-way compensated piston valve
Pressure class ..... PN 25 bars (362 psi)
Flow characteristic ..... Eq% (logarithmic)
Rangeability 25
Leakage ..... max. 0,1% of K_V (C_V)
Δp_m ..... max. 800 kPa (116 psi), water
Medium temperature:
Max. ..... 180 °C (356 °F)
Min. ..... –20 °C (-4 °F)
Flange connection ..... hole pattern acc. to SS335 and ISO2084
Suitable weld flange with collar ..... SS 2034
Materials:
Body ..... nodular iron SS 0727-02
Piston and sleeve ..... stainless steel SS 2346-02
Stem ..... stainless steel SS 2346-02
Packing box, standard ..... type T
Special packing box for max. 50% glycol ..... type Q

Remarks

The rangeability is the ratio of K_V to K_{Vmin} (C_V to C_{Vmin}).

K_V (C_V) is the valve flow at the max. lift and a pressure drop of 100 kPa across the valve.

K_{Vmin} (C_{Vmin}) is the minimum controllable flow at a pressure drop of 100 kPa, within the flow range where the characteristic meets the requirements on characteristic slope according to IEC534-1.

h is the lift of the valve in mm (in.).

Δp_m is max. pressure drop across a fully open valve.

Size DN	Size in.	K_V m³/h	Cv	h mm	h in.	Part number	$K_{V\,min}$ m³/h	$C_{V\,min}$
40	1½	16	18.7	31.5	1.24	721-9574-000	0.7	0.82
		25	29.3	31.5	1.24	721-9546-000	1.0	1.17
65	2½	37	43.3	40.9	1.61	721-9550-000	1.5	1.76
		51	59.7	40.9	1.61	721-9554-000	2.0	2.34
100	4	80	93.6	50.3	1.98	721-9558-000	3.2	3.74
		113	132.2	50.3	1.98	721-9562-000	4.5	5.27

FUNCTION AND FLOW CHARACTERISTIC

The valve has a cylindrical piston which moves inside a cylindrical seat, equipped with a number of holes.

When the piston moves upwards the holes are gradually exposed, resulting in increasing flow.

The piston is open at both ends and the valve is therefore compensated. This means that the pressure drop across the valve will not be affected by the movement of the piston. The valve can therefore handle large flows without a corresponding increase in the required actuating force.

The flow characteristic is equal percentage (Eq%, also called logarithmic), giving an equal-percentage change in flow. The latter is necessary to give good control in systems with large load variations.

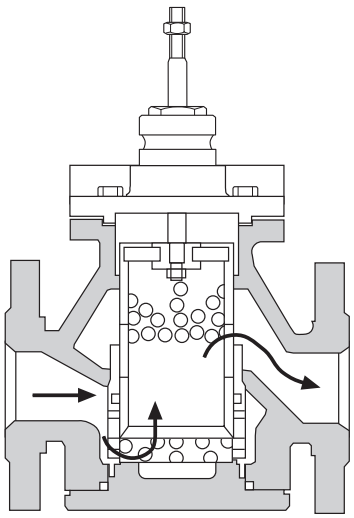

Figure 1

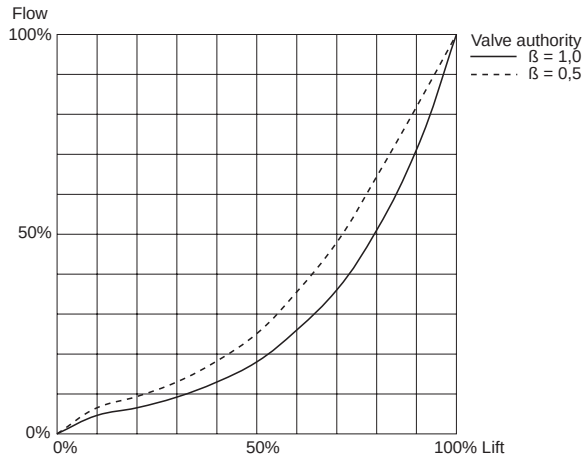

Figure 2

ACTUATOR

The recommended actuator is TAC Forta M800.

ΔP_c = Max. close-off pressure drop across the valve.

Size		M800 ΔP_c	
DN	in.	kPa	psi
40	1½	1600	232
65	2½	600	87
100	4	450	65

INSTALLATION

The valve is to be installed in the line so that the direction of flow coincides with the arrow on the valve body.

Whenever possible, the valve should be installed in the return line, to avoid exposing the valve to unnecessarily high temperatures. The valve must not be mounted with the actuator under the valve.

To prevent dirt from getting caught between plug and seat, it is recommended to install a strainer upstream of the valve. Also flush and rinse the piping system before installation of the valve.

A. Typical installation without local circulating pump.

To provide good function the pressure drop across the valve should be no less than half of the available pressure (Δp). This corresponds to a valve authority of 50%.

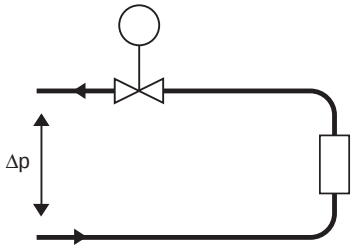

Figure 3

B. Typical installation with local circulating pump.

The K_V/C_V value of the valve to be selected so that the entire available pressure drop (Δp) falls across the control valve.

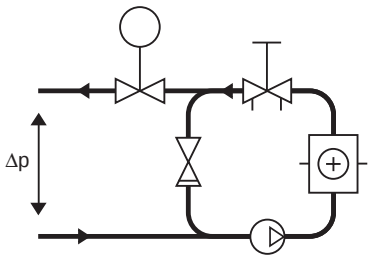

Figure 4

PRESSURE DROP DIAGRAM

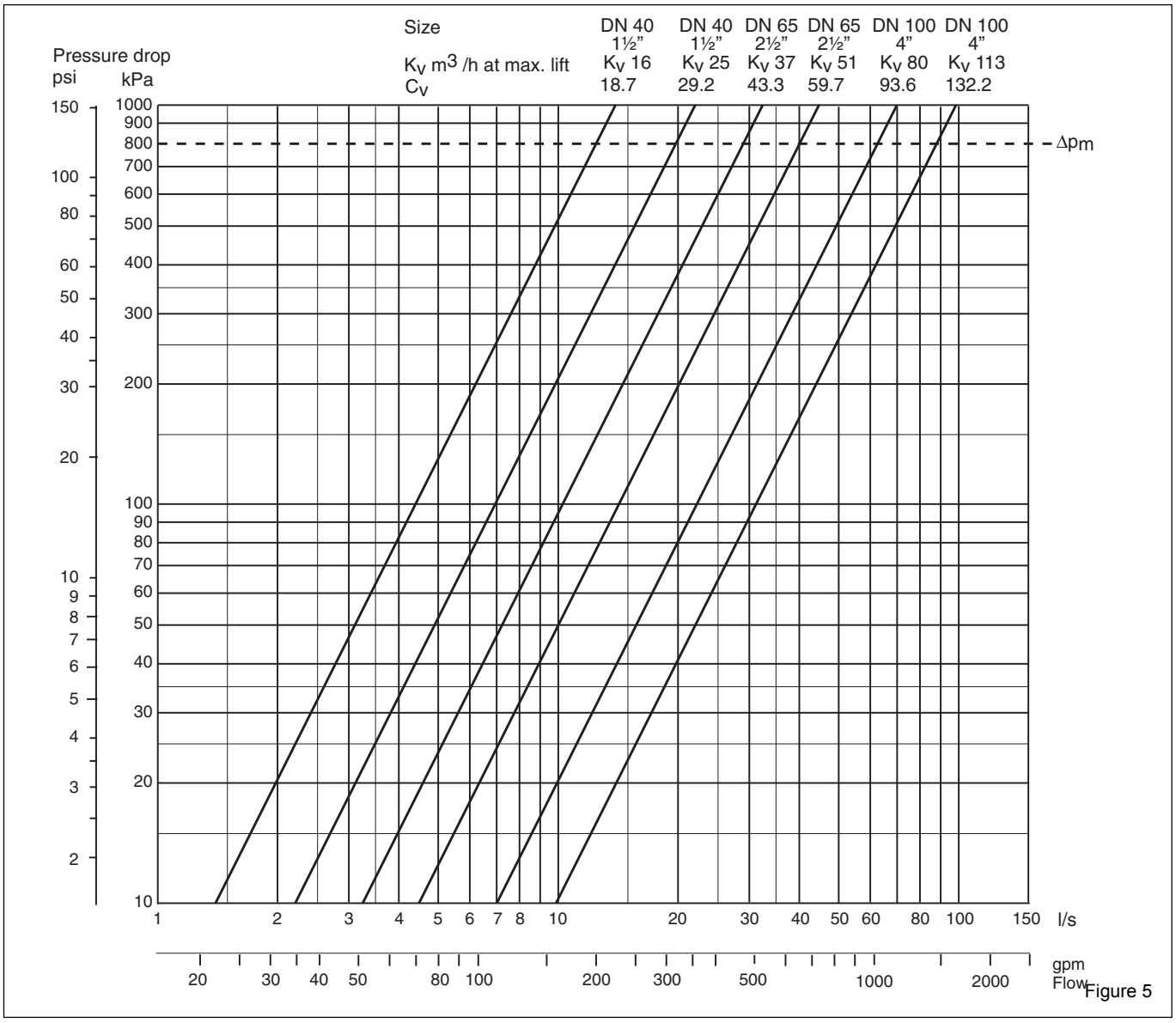

Figure 5

CAVITATION

Cavitation takes place in a valve when the velocity of the flow between the plug and seat increases to the extent that gas bubbles are created in the water.

When, after the plug and seat, the velocity decreases, the gas bubbles collapse (implode), generating considerable noise and causing considerable wear on the valve.

By means of the cavitation diagram shown in figure 6 it can be checked if risk of cavitation exists with the working conditions in the pertinent installation. Proceed as follows:

Using the static pressure before the valve (e.g. 1 000 kPa), plot a horizontal line to the line for the temperature of the liquid (e.g. 120 °C).

From the intersection point, plot a vertical line downwards and read off the max. permissible pressure drop across the valve.

If the computed pressure drop exceeds the value read from the diagram there is risk of cavitation.

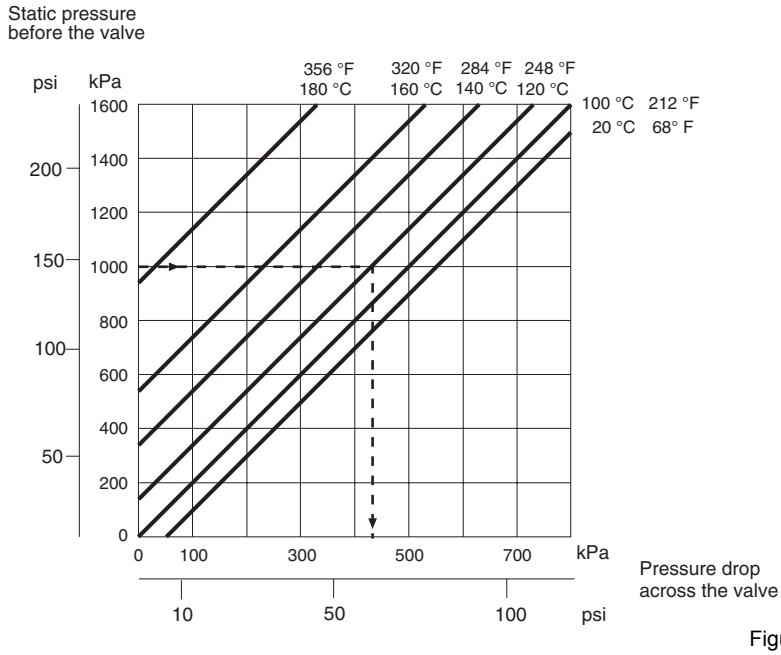

Figure 6

MEASUREMENTS AND WEIGHTS

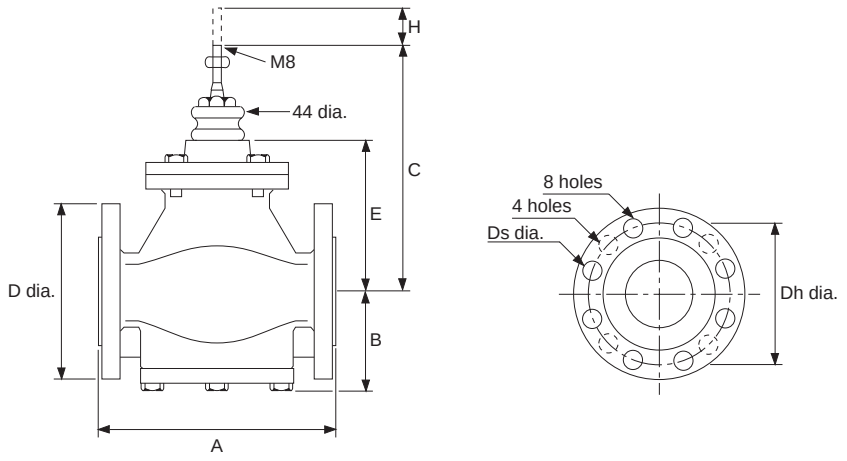

Figure 7

Size		Dimensions														Weight	
		A		B		C		E		dia D		dia Dh		dia Ds		No. of	H			
DN	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	holes	mm	in.	kg	lb.
40	1½	200	7.9	82	3.2	212	8.3	132	5.3	150	5.9	110	4.3	18	0.7	4	31.5	1.24	15	30.9
65	2½	290	11.4	106	4.7	228	9	148	5.8	185	7.3	145	5.7	18	0.7	8	40.9	1.61	32	71
100	4	350	13.8	124	4.9	258	10.2	178	7.0	235	9.3	190	7.5	22	0.9	8	50.3	1.98	54	119

SPARE PARTS

Standard packing box
Type T: max. 180 °C (356 °F)
Part number: 080-2064-005.

Special packing box for max. 50% glycol
Type Q: –20 to 30 °C (–4 to 86 °F)
Part number: 080-4724-005.