

Hydro-Unit CUBE

Technical specification booklet
series: Cube FR, Cube DOL



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1 Introduction

1.1 Abbreviations

Abbreviation	Explanation
HU	Hydro-Unit
CC	Cube Control
MF (FR)	Cube Control Multi Frequency (each pump frequency controlled)
DOL	Direct On Line
AISI	Stainless steel
G	Thread

1.2 Range

CUBE FR	DPV(M)E 2 60 Hz!	DPV(M)E 4 60 Hz!	DPV(M)E 6 60 Hz!
PN10	/2 - /6	/2 - /4	/2 - /3

CUBE DOL	DPV(M)E 2	DPV(M)E 4	DPV(M)E 6
PN10	/2 - /6	/2 - /6	/2 - /5

1.3 Water leakage detection

In side the Cube there is a detector which triggers an alarm if there is water inside the Cube. This may be due to a leak in the unit. This detection is active in horizontal and vertical position of the Cube.

1.4 Working range

The working range of the installation can be summarised as follows:

Table 1: Specification of the working range

Type	Hydro-Unit CUBE
Ambient temperature [°C]	0 - 30
Liquid temperature [°C]	+4 - 40
Maximum working pressure [kPa]	1.000
Supply pressure [kPa]	Niet cavitierend. Minimaal: 120 kPa Maximaal: toevoerdruk plus pumpdruk mogen samen niet hoger zijn dan 1000 kPa
Maximum level	1000 m above sea level

Table 2: Specific applications

Type	Area of application
Hydro-Unit CUBE	(Drinking) water supply systems, pressure boosting in apartment buildings

1.5 Basic materials

Item	Hydraulic part	Casting parts	Sealing
pump	1.4301 (AISI304)	1.4308 (AISI304)	EPDM
Non return valve	POM		Rubber
Valve	1.4301 (AISI304)	1.4301 (AISI304)	
Manifolds	1.4301 (AISI304)		
Membrane tank	connection part AISI		Butyl-rubber
Pressure transmitter	1.4305 (AISI303)		
Housing	PP 30 V1		
Misc.	May contain brass parts		

1.6 Flow through membrane tank

The membrane tank of the Cube is a flow through type. This means that the water inside the tank is always refreshed when there is flow.

1.7 Standard motor data

Table 3: Motor data 3 fase 2p 50 Hz

Rated power output [kW]	Rated Voltage [V]	Rated amperage [A]	Factor Ia/In	Cos Phi	voltage tolerance	rated speed [rpm]	Motor efficiency	sound pressure [dB(A)]	Max. starts per hour	IP
0,37	230/400	1,6/0,95	4,5	0,76	10%	2865	76	60	50	55
0,55	230/400	2,1/1,2	5,3	0,8	10%	2880	82	60	50	55
0,75	230/400	3,1/1,8	6,0	0,77	10%	2865	80	60	50	55
1,1	230/400	4,2/2,4	6,8	0,79	10%	2870	81	60	50	55
1,5	230/400	5,7/3,3	7,6	0,81	10%	2900	81,8	56	50	55
2,2	230/400	8,2/4,7	7,3	0,81	10%	2870	83,5	56	30	55

1.8 Model code

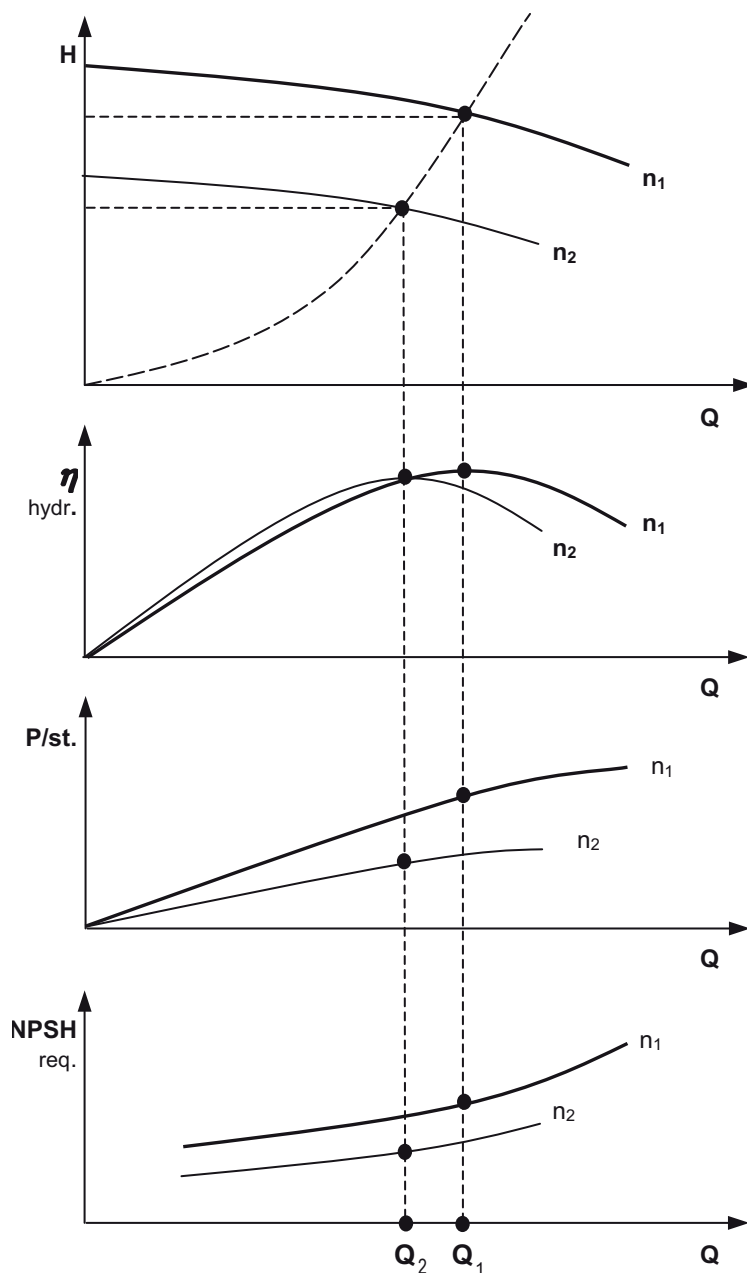
CUBE	DPVME	2	/2	AISI304	G 5/4	AISI304	G 5/4	G 5/4	PN10	PS	DOL	3x400V+N 50 Hz	16A	
CUBE														Cube
	DPVME													pump serie
		2 4 6												Type pump
			/2.../6											number of stages
				AISI304										Material appendages
					G 5/4									Appendage size
						AISI304								Material manifold
								G 5/4 G 6/4						Connection manifolds
									PN10					pressure class unit
										PT				Run dry protection bij a pressure transmitter
											DOL MF 60 Hz			Control: MCMF = frequency inverter per pump (60 Hz pump frequency) DOL = Direct On Line
												3x400V+N 50 Hz		Supply voltage
													16A	Maximum fuse supply

2 Performance characteristics

2.1 Performance with variable frequency drive

The minimum frequency of the Hydro-Unit CUBE motor should be limited to 10 Hz to ensure sufficient cooling. When the rotational speed exceeds the nominal speed of the motor, make sure that the power output of the motor is suitable to drive the corresponding pump model.

The performance of the pump differs from the fixed speed performance according to the recalculation scheme.



$$Q_2 = \frac{n_2}{n_1} \cdot Q_1$$

$$H_2 = \left(\frac{n_2}{n_1} \right)^2 \cdot H_1$$

$$\eta_2 = 1 - \left((1 - \eta_1) \cdot \left(\frac{n_1}{n_2} \right)^{0.1} \right)$$

$$P_2 = \left(\frac{n_2}{n_1} \right)^3 \cdot P_1$$

$$NPSH_2 = \left(\frac{n_2}{n_1} \right)^2 \cdot NPSH_1$$

Figure 1: Performance characteristics

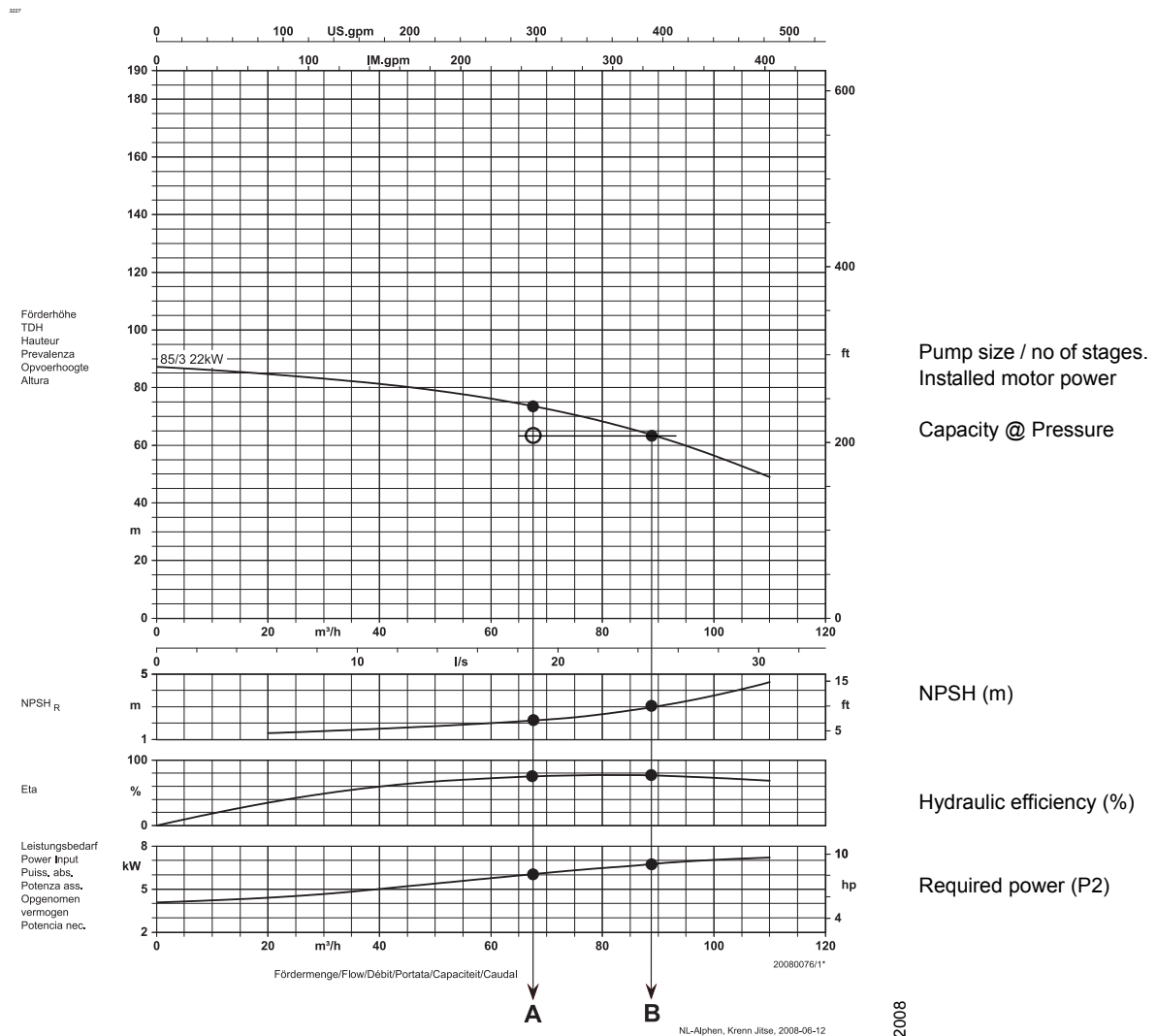
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2.2 How to read the values from the curves

To find the required hydraulic information from the published curves, it is important to know the application in which the pump has to be installed.

There are two main distinction to be made:

- A Flow determined (like booster sets and cleaning) → Opening taps
- B Pressure determined (like boiler feed and reverse osmosis systems) → Facing counter pressure.



2.3 Hydraulic performance DPVME 2 (50 Hz ~ 2850 rpm) (1 pump in operation)

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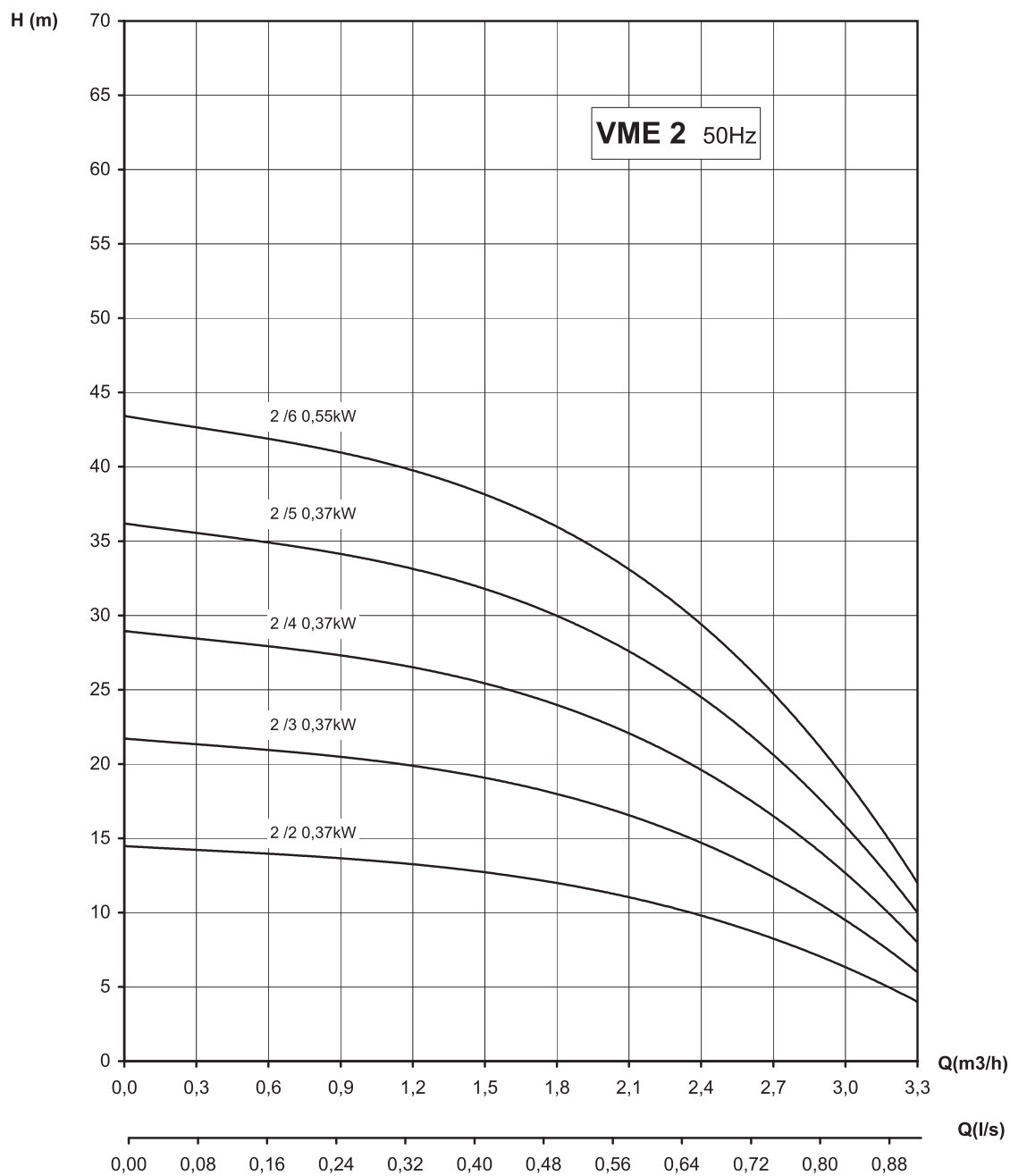


Figure 3: VME 2 (50 Hz ~ 2850 rpm)

2.4 **Hydraulic performance DPVME 2 (60 Hz ~ 3450 rpm)**
(1 pump in operation)

© 2002

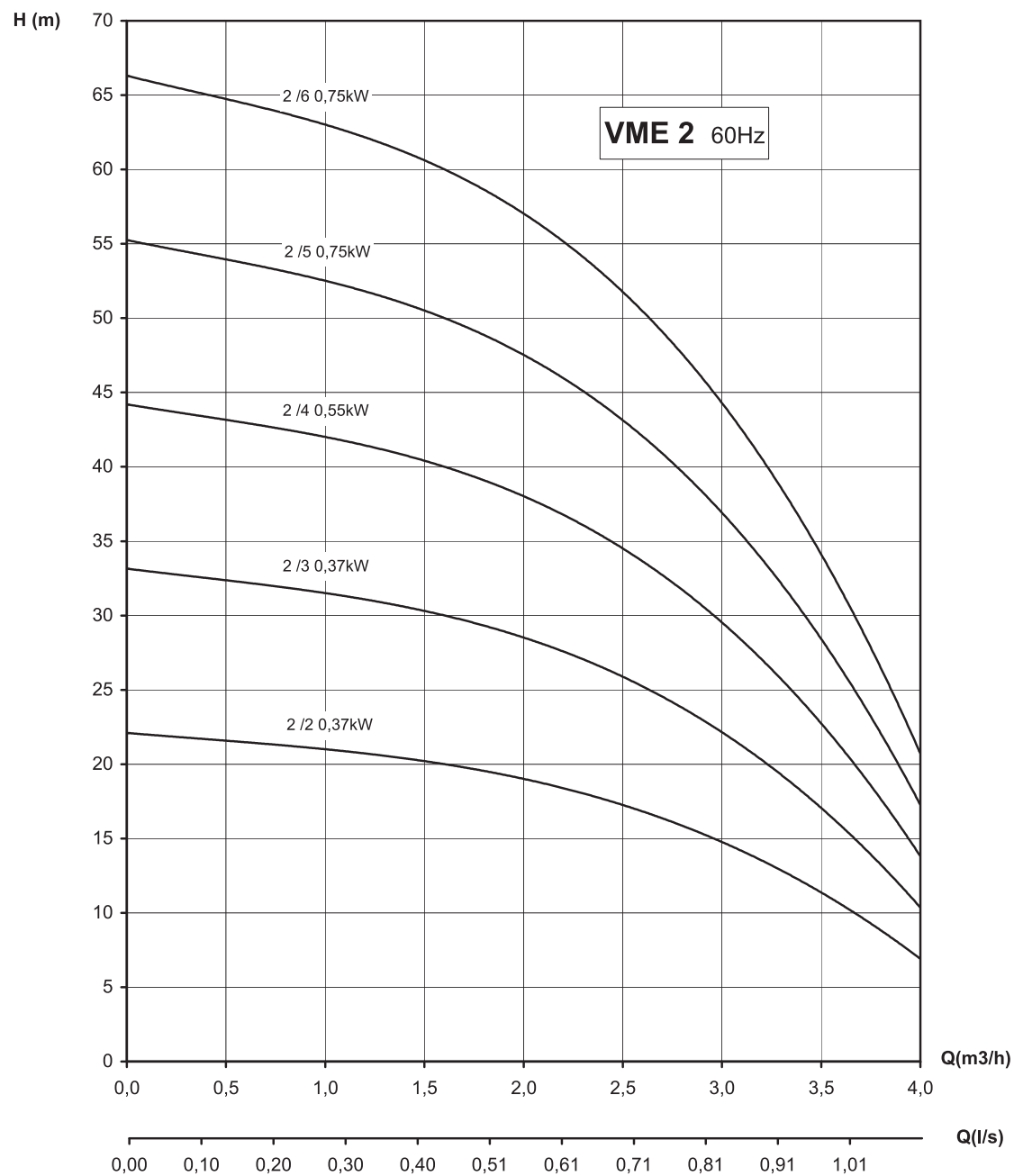


Figure 4: VME 2 (60 Hz ~ 3450 rpm)

2.5 Hydraulic performance DPVME 4 (50 Hz ~ 2850 rpm) (1 pump in operation)

© 2017

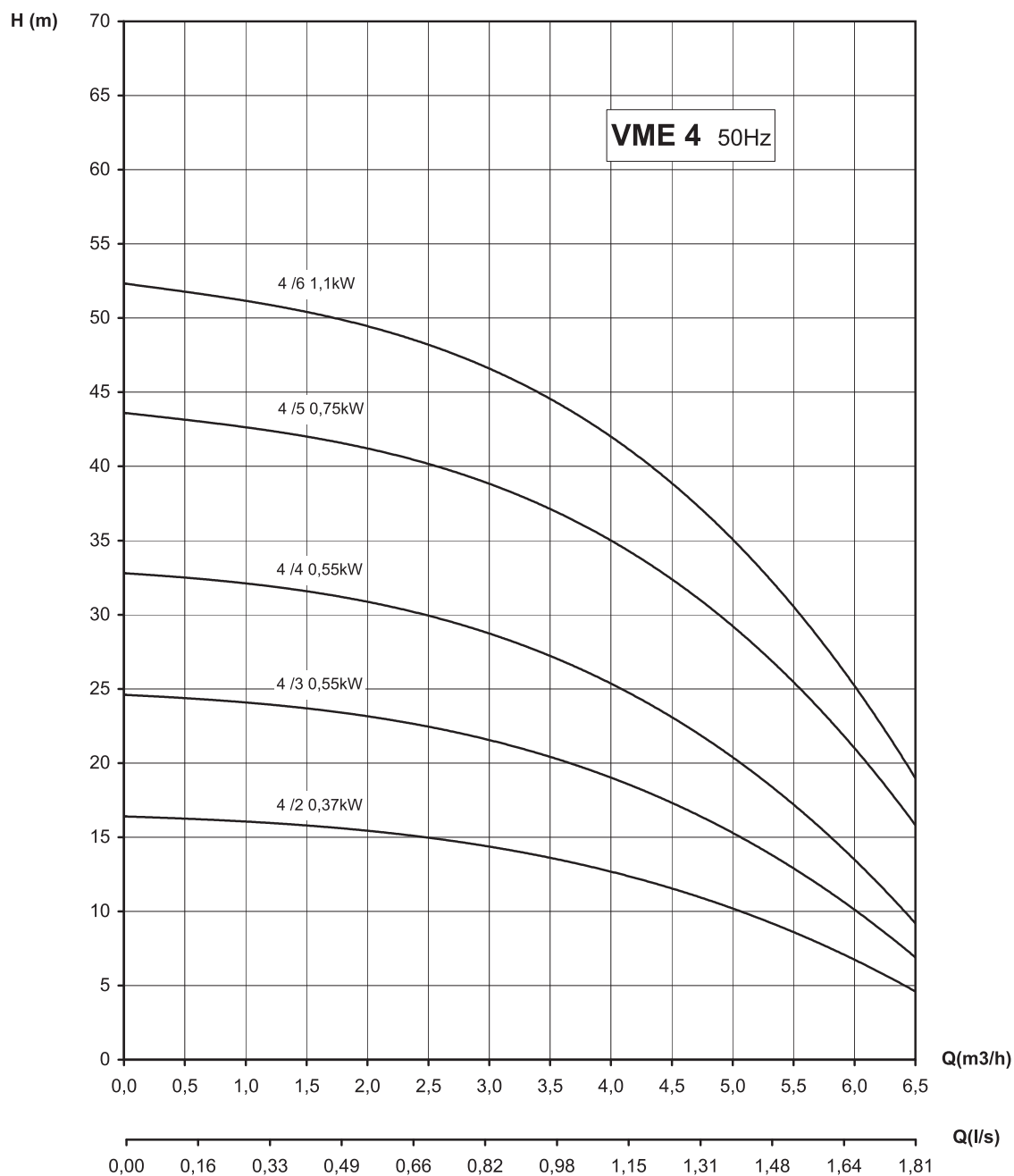


Figure 5: VME 4 (50 Hz ~ 2850 rpm)

2.6 **Hydraulic performance DPVME 4 (60 Hz ~ 3450 rpm)**
(1 pump in operation)

© 2004

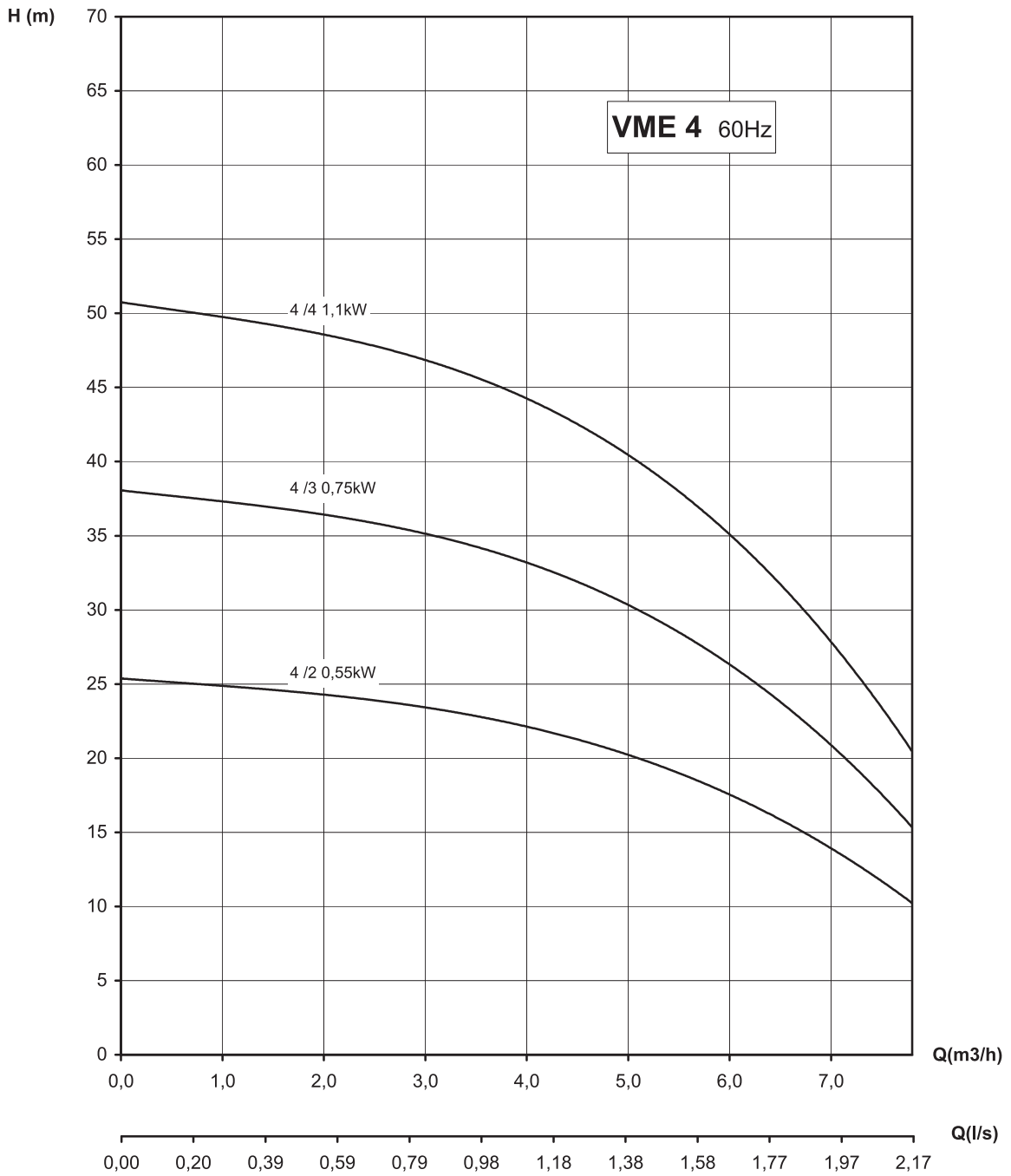


Figure 6: VME 4 (60 Hz ~ 3450 rpm)

2.7 Hydraulic performance DPVME 6 (50 Hz ~ 2850 rpm) (1 pump in operation)

© 2002

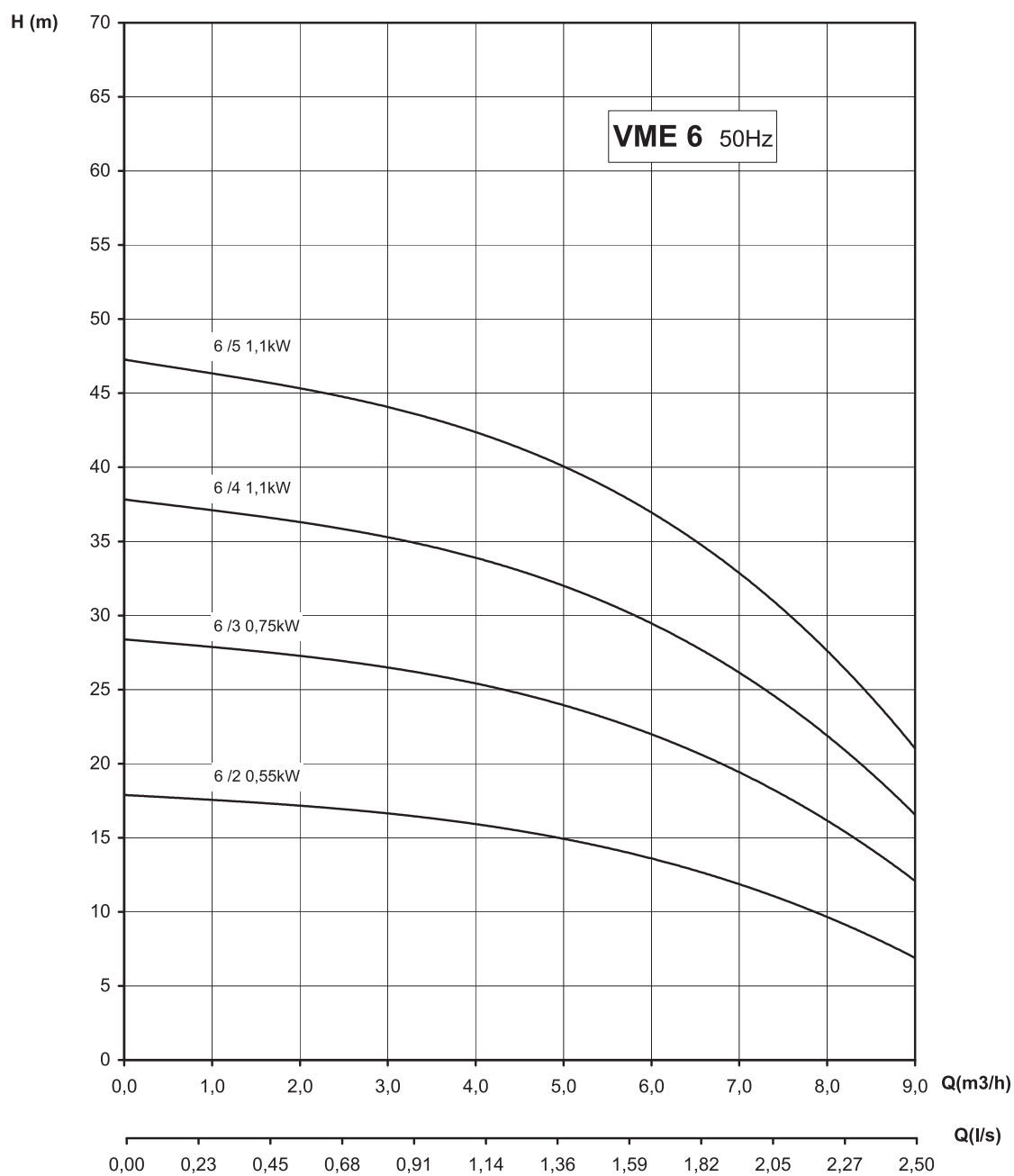


Figure 7: VME 6 (50 Hz ~ 2850 rpm)

2.8 **Hydraulic performance DPVME 6 (60 Hz ~ 3450 rpm)**
(1 pump in operation)

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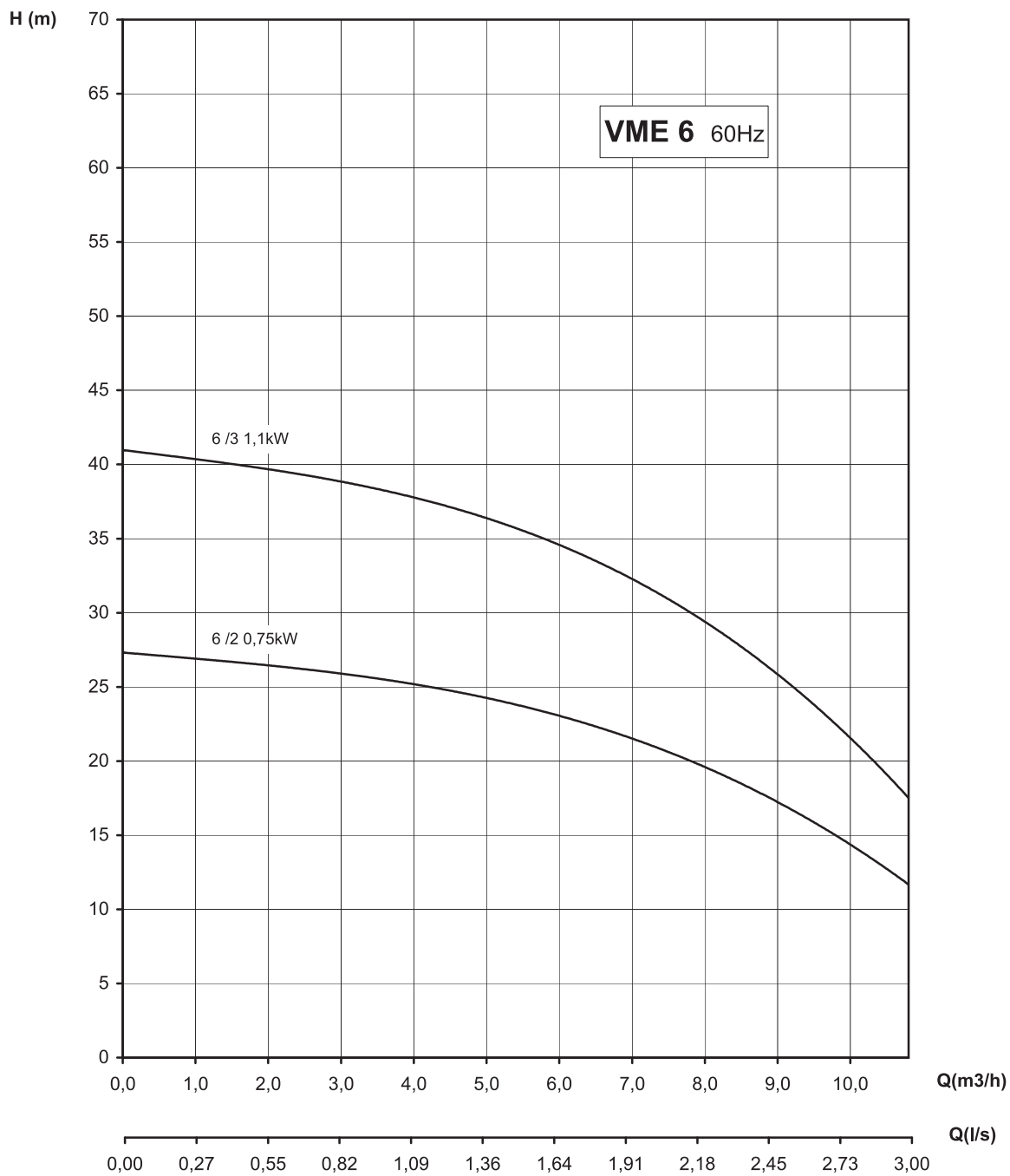


Figure 8: VME 6 (60 Hz ~ 3450 rpm)

3 Specification

3.1 Dimensions and weights HU CUBE 2 DPVME FR

3.1.1 Pump frequency = 60 Hz - 3500 rpm

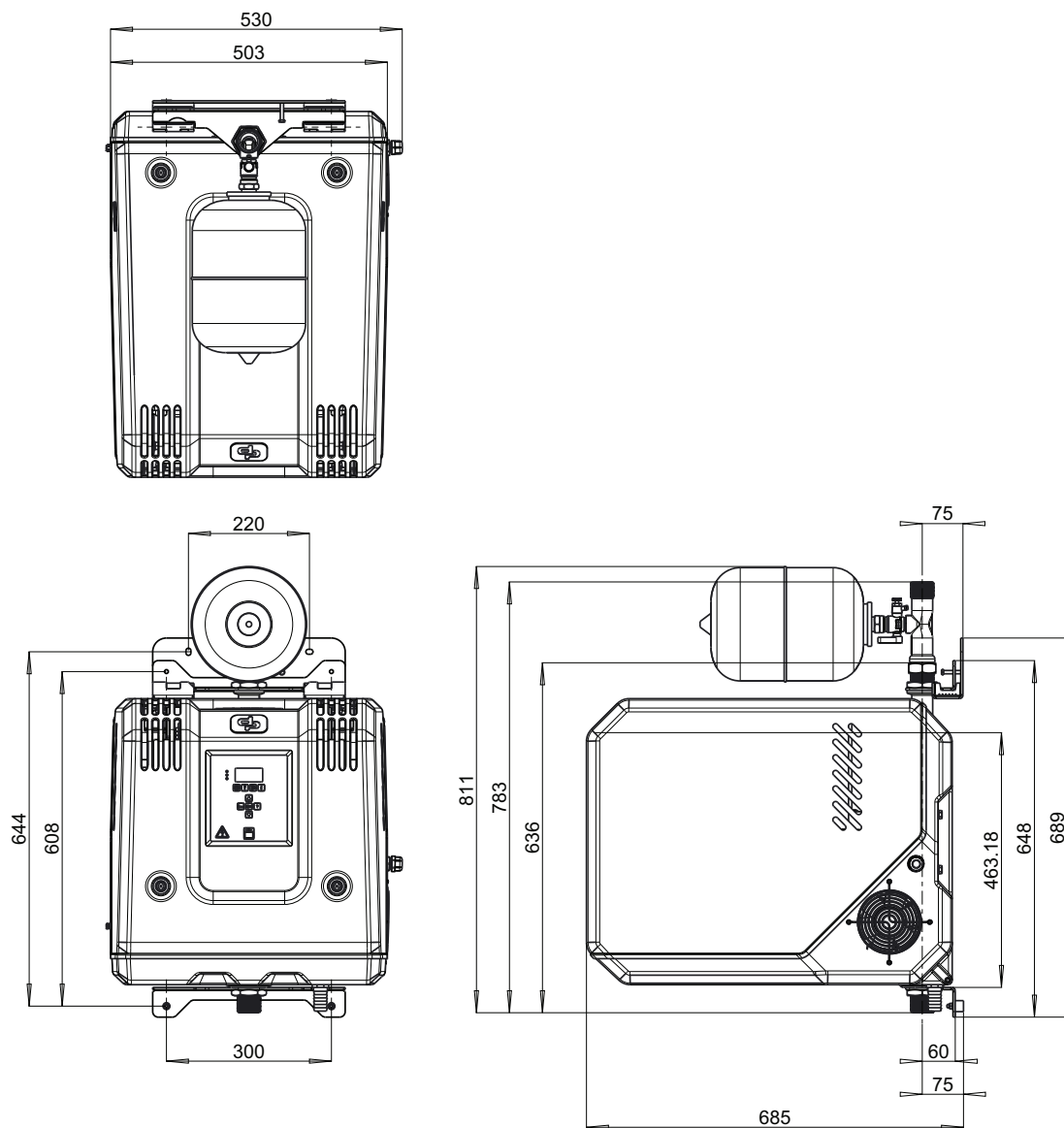


Figure 9: Hydro-Unit CUBE

Table 4: General values

Construction / pressure class code	PN 10
Run-dry protection	PRESSURE TRANSMITTER
Fitting (material - connection)	AISI304 G 5/4
Membrane tank	8 l
Electric control	MCMF 60 Hz
Frequency	50 Hz
Insulation class (unit)	IP21
I max (unit)	13 A
Maximum fuse	16 A
Power supply	3 x 400 V + N
Mass	85 kg
Drawing number	20091291

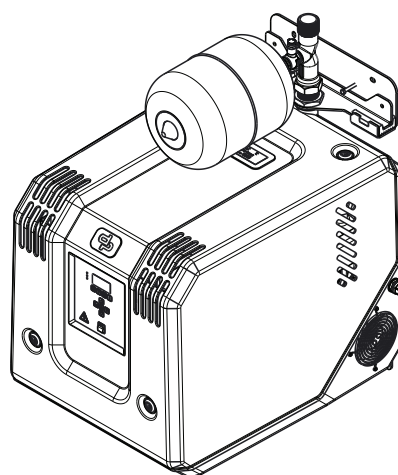


Table 5: Detailed values

Article number	Number of stages	Manifold (material - connection)	Pump speed
DPVME 2			
HU212201C64T	/2	AISI304 G 5/4	3300 rpm
HU212301C64T	/3	AISI304 G 5/4	3300 rpm
HU212401C64T	/4	AISI304 G 5/4	3345 rpm
HU212501C64T	/5	AISI304 G 5/4	3450 rpm
HU212601C64T	/6	AISI304 G 5/4	3450 rpm
DPVME 4			
HU214201D64T	/2	AISI304 G 6/4	3345 rpm
HU214301D64T	/3	AISI304 G 6/4	3450 rpm
HU214401D64T	/4	AISI304 G 6/4	3450 rpm
DPVME 6			
HU216201D64T	/2	AISI304 G 6/4	3450 rpm
HU216301D64T	/3	AISI304 G 6/4	3450 rpm

3.2 Dimensions and weights HU CUBE 2 DPVME DOL

3.2.1 Pump frequency = 50 Hz - 2900 rpm

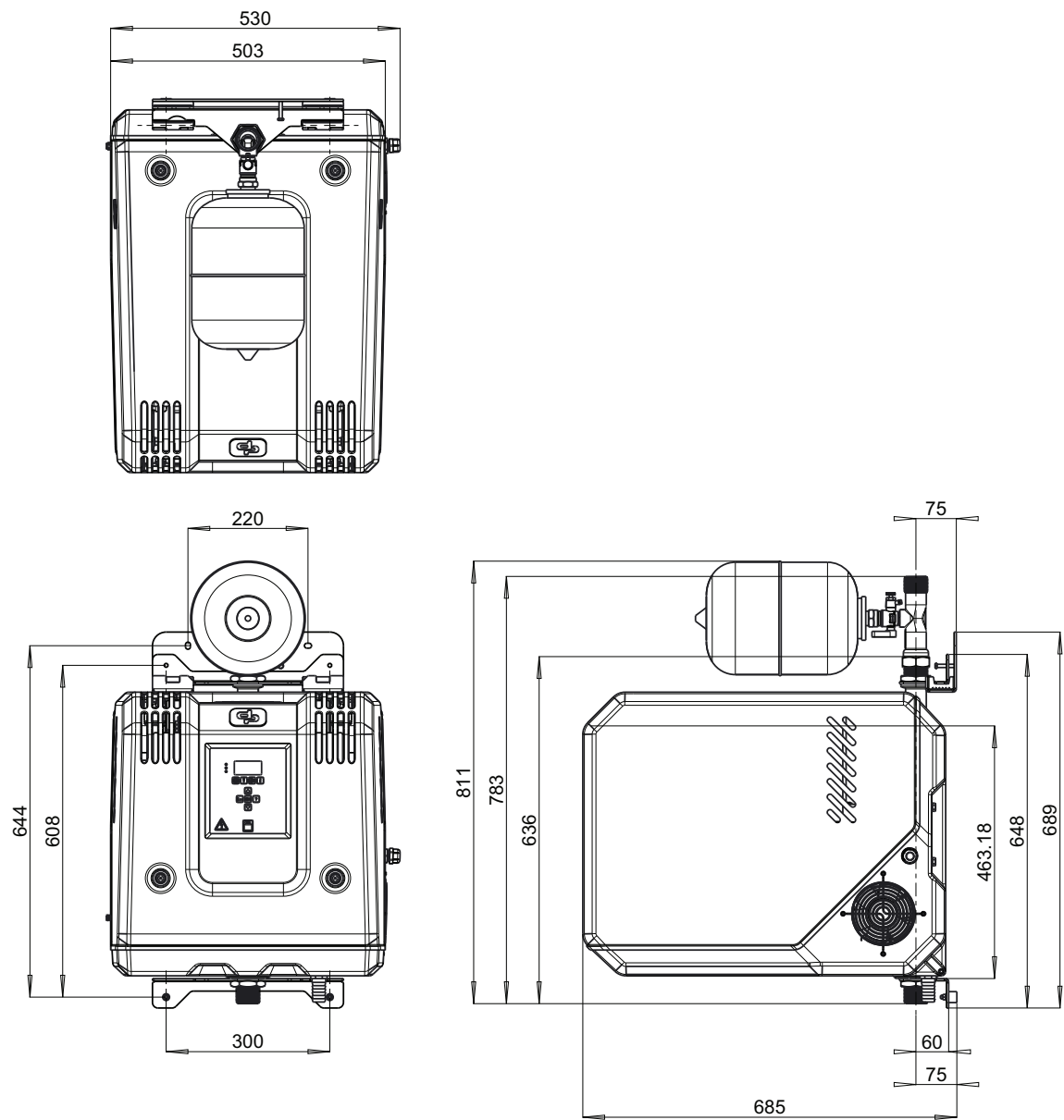


Figure 10: Hydro-Unit CUBE

Table 6: General values

Construction / pressure class code	PN 10
Run-dry protection	PRESSURE TRANSMITTER
Fitting (material - connection)	AISI304 G 5/4
membrane tank	8 l
Electric control	MC DOL
Frequency	50 Hz
Insulation class (unit)	IP21
I max (unit)	10 A
Maximum fuse	16 A
Power supply	3 x 400 V + N
Mass	85 kg
Drawing number	20091291

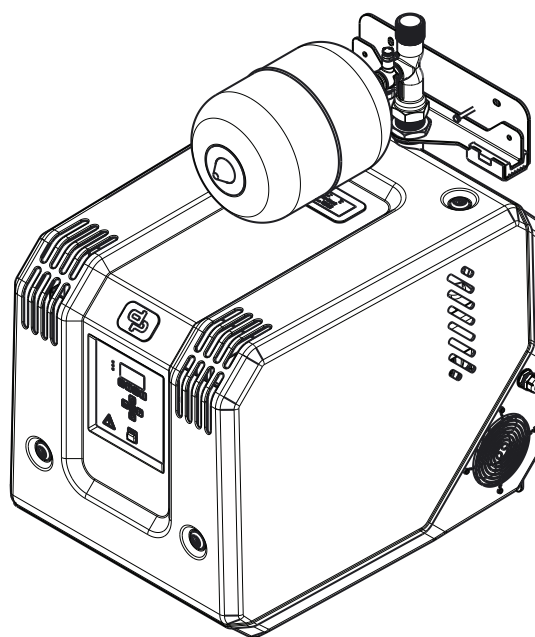


Table 7: Detailed values

Article number	Number of stages	Manifold (material - connection)	Pump speed
DPVME 2			
HU212201C31T	/2	AISI304 G 5/4	2750 rpm
HU212301C31T	/3	AISI304 G 5/4	2750 rpm
HU212401C31T	/4	AISI304 G 5/4	2750 rpm
HU212501C31T	/5	AISI304 G 5/4	2750 rpm
HU212601C31T	/6	AISI304 G 5/4	2790 rpm
DPVME 4			
HU214201C31T	/2	AISI304 G 5/4	2750 rpm
HU214301C31T	/3	AISI304 G 5/4	2790 rpm
HU214401C31T	/4	AISI304 G 5/4	2790 rpm
HU214501C31T	/5	AISI304 G 5/4	2875 rpm
HU214601C31T	/6	AISI304 G 5/4	2875 rpm
DPVME 6			
HU216201D31T	/2	AISI304 G 6/4	2750 rpm
HU216301D31T	/3	AISI304 G 6/4	2790 rpm
HU216401D31T	/4	AISI304 G 6/4	2875 rpm
HU216501D31T	/5	AISI304 G 6/4	2875 rpm

3.3 Specification

3.3.1 Specification text

Two-pump booster unit consisting of:

- Two DPVME vertical multi-stage centrifugal pumps of which all metal parts that come into contact with the medium have been made of AISI304. Complete with built-in non-return valves.
- Four ball valves AISI304.
- AISI304 manifolds, without dead-spot pipe.
- Run-dry protection kit consisting of a pressure transmitter.
- Discharge pressure control kit consisting of a pressure transmitter.
- 8 litres flow-through membrane tank.

The installation has been completely enclosed. The Cube control system is found inside the housing.

Additionally, the system includes:

- for each pump a frequency converter (MC MF) or for each pump a motor starter relay (MC DOL),
- 2.5 m cable with a junction box complete with load switch.
- For each pump a thermal motor protection switch.
- Fail-safe potential free failure outputs urgent and non-urgent (NO and NC). These can simple be connected on the outside using the included plug
- The unit is delivered with 4 vibration isolators.

The Cube control microprocessor module has the following basic functions:

- pressure control;
- pump staging;
- continuously optimised minimum-run time of the pumps;
- Adjustable correction factor for pressure loss in the system;
- 24-hours test-run function;
- adjustable delay of the underpressure/run-dry protection
- display options:
 - current system values;
 - pump status;
 - operating hours;
 - comprehensive failure interface.

4 Auxiliaries

4.1 Mounting sets

4.1.1 Article numbers of mounting sets

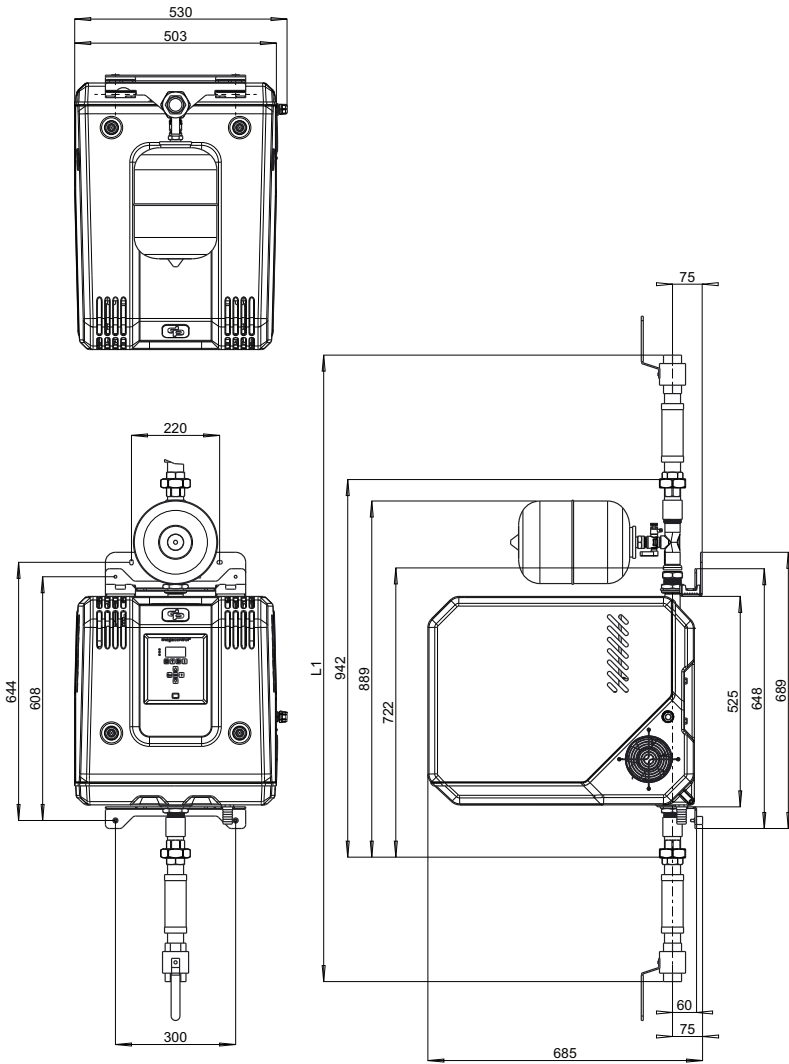
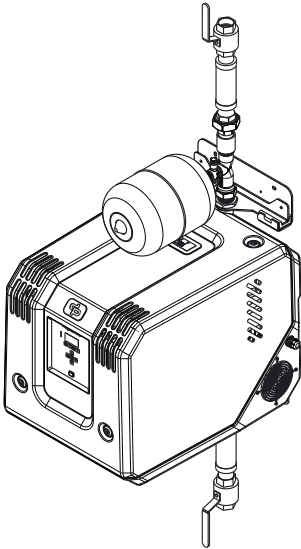
Table 8: Delivered in the box with the Hydro-Unit CUBE

Article number	Description
OV10022901	MOUNTING KIT CUBE Wall MOUNTING SET
OV10022902	MOUNTING KIT CUBE AISI304 G 5/4 > 35 mm CAPILLARY
OV10022903	MOUNTING KIT CUBE AISI304 G 5/4 > 42 mm CAPILLARY
OV10022904	MOUNTING KIT CUBE AISI304 G 6/4 > 42 mm CAPILLARY
OV10022905	MOUNTING KIT CUBE AISI304 G 6/4 > 54 mm CAPILLARY
OV10022906	MOUNTING KIT CUBE AISI304 G 5/4 > 35 mm CLAMPING
OV10022907	MOUNTING KIT CUBE AISI304 G 5/4 > 42 mm CLAMPING
OV10022908	MOUNTING KIT CUBE AISI304 G 6/4 > 42 mm CLAMPING
OV10022909	MOUNTING KIT CUBE AISI304 G 6/4 > 54 mm CLAMPING
OV10022910	MOUNTING KIT CUBE AISI304 G 5/4 > G 5/4 BI
OV10022911	MOUNTING KIT CUBE AISI304 G 5/4 > G 6/4 BI
OV10022912	MOUNTING KIT CUBE AISI304 G 6/4 > G 6/4 BI
OV10022913	MOUNTING KIT CUBE AISI304 G 6/4 > G 2 BI
OV10022914	WALL SOCKET WITH LOAD SWITCH 3-PHASE + N + EARTH 6H 16A 400V CUBE IP66
OV10022557	PLUG WITH PHASE CONVERTER, 3-PHASE + N + EARTH, INSTEAD OF SWITCH BOX WITH MAIN SWITCH

Table 9: Separate delivery

Article number	Description
71100160	MOUNTING KIT CUBE WALL MOUNTING SET
71100161	MOUNTING KIT CUBE AISI304 G 5/4 > 35 mm CAPILLARY
71100162	MOUNTING KIT CUBE AISI304 G 5/4 > 42 mm CAPILLARY
71100163	MOUNTING KIT CUBE AISI304 G 6/4 > 42 mm CAPILLARY
71100164	MOUNTING KIT CUBE AISI304 G 6/4 > 54 mm CAPILLARY
71100165	MOUNTING KIT CUBE AISI304 G 5/4 > 35 mm CLAMPING
71100166	MOUNTING KIT CUBE AISI304 G 5/4 > 42 mm CLAMPING
71100167	MOUNTING KIT CUBE AISI304 G 6/4 > 42 mm CLAMPING
71100168	MOUNTING KIT CUBE AISI304 G 6/4 > 54 mm CLAMPING
71100169	MOUNTING KIT CUBE AISI304 G 5/4 > G 5/4 BI
71100170	MOUNTING KIT CUBE AISI304 G 5/4 > G 6/4 BI
71100171	MOUNTING KIT CUBE AISI304 G 6/4 > G 6/4 BI
71100172	MOUNTING KIT CUBE AISI304 G 6/4 > G 2 BI
77928091	WALL SOCKET WITH LOAD SWITCH 3-PHASE + N + EARTH 6H 16A 400V CUBE IP66
11012022	LIFT TOOL LxBxH= 800x 150x 5 mm AISI304 CUBE

4.1.2 Drawing with mounting kit



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5 Accessories

5.1 Accessories Hydro-Unit CUBE

5.1.1 Pressure reducing valves

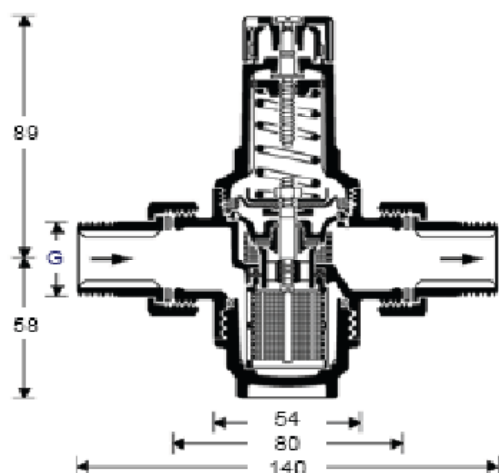


Figure 11: Pressure reducing valve (DO6)

3242/24072008

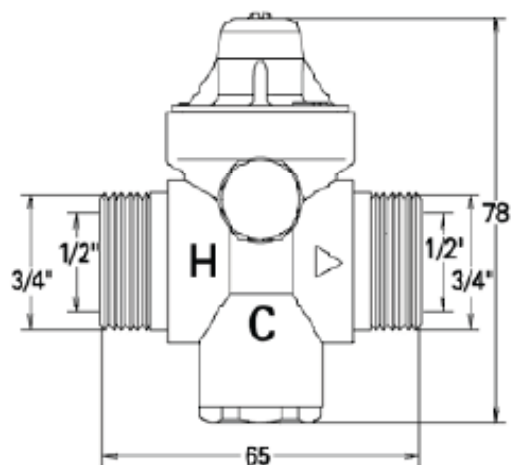


Figure 12: Pressure reducing valve (73220023)

3243/24072008

Article number	Connection	Mating dimensions	Dimensions	Type	Bore	Pressure class/range	Specific materials	Model
73220016	EXT	G 1/2	L = 140 mm	1.5-6 bar D06F	DN15	PN16	MS	~
73220017	EXT	G 1/2	L = 140 mm	0.5-2 bar D06FN	DN15	PN16	MS	~
73220019	CAP	22 mm	L = 160 mm	1,5-12 bar D06FH	DN20	PN25	MS	~
73220020	CAP	22 mm	L = 160 mm	1.5-6 bar D06F	DN20	PN16	MS	~
73220022	EXT	G 3/4	L = 160 mm	1.5-6 bar D06F	DN20	PN16	MS	~
73220023	EXT (INT)	3/4 (1/2)	L = 65 mm	1.5-5 bar	DN15	PN15	MS	
73220027	CAP	28 mm	L = 180 mm	1.5-6 bar D06F	DN25	PN16	MS	~
73220028	EXT	G 1	L = 180 mm	1.5-6 bar D06F	DN25	PN25	MS	~
73220030	EXT	G 1	L = 180 mm	1,5-12 bar D06FH	DN25	PN25	MS	~
73220034	CAP	35 mm	L = 200 mm	1.5-6 bar D06F	DN32	PN16	MS	~
73220035	EXT	G 5/4	L = 200 mm	1.5-6 bar D06F	DN32	PN16	MS	~
73220036	EXT	G 5/4	L = 200 mm	1,5-12 bar D06FH	DN32	PN25	MS	~
73220042	EXT	G 6/4	L = 225 mm	1.5-6 bar D06F	DN40	PN16	MS	~
73220043	EXT	G 6/4	L = 225 mm	1,5-12 bar D06FH	DN40	PN25	MS	~
73220944	CAP	42 mm	L = 225 mm	1.5-6 bar D06F	DN40	PN16	MS	~
73220952	CAP	54 mm	L = 255 mm	1.5-6 bar D06F	DN50	PN16	MS	~
73220953	EXT	G 2	L = 255 mm	1.5-6 bar D06F	DN50	PN16	MS	~
73220954	EXT	G 2	L = 255 mm	1,5-12 bar D06FH	DN50	PN25	MS	~

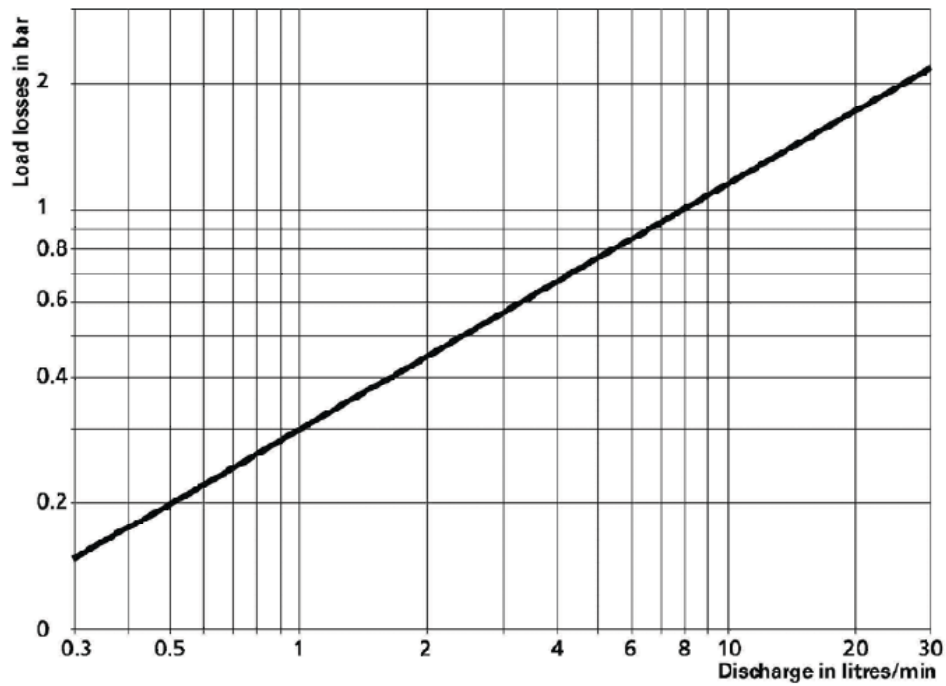


Figure 13: Pressure reducer valve diagram 73220023

3244/24072008

Kvs-value Diagram

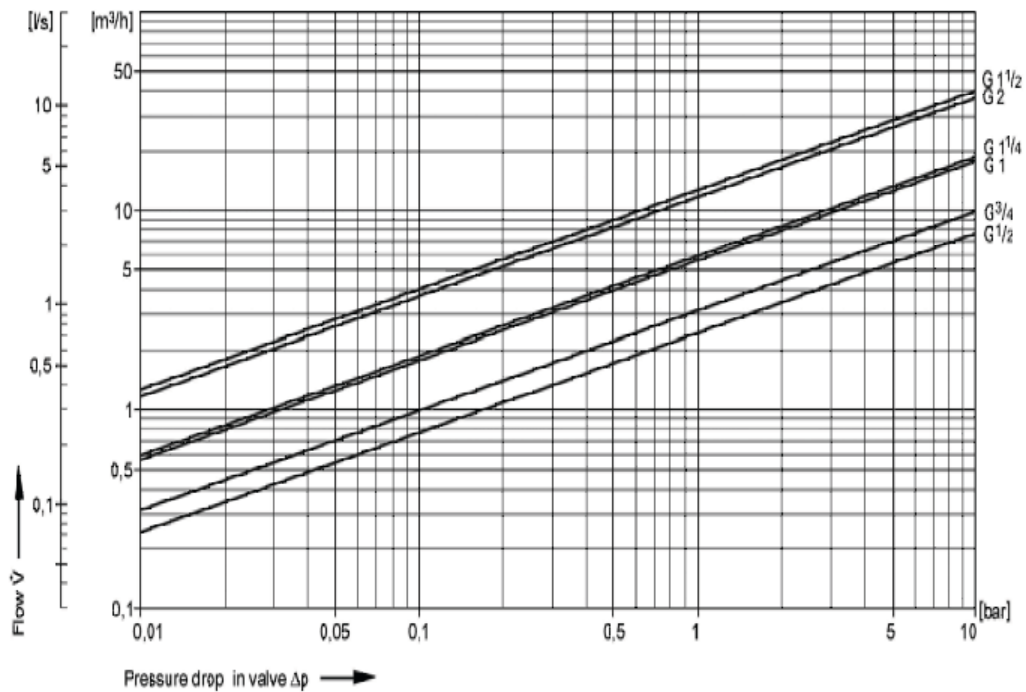


Figure 14: Pressure loss diagram reduce valve DO6

3245/24072008

6 Annexes

6.1 Q square root n houses

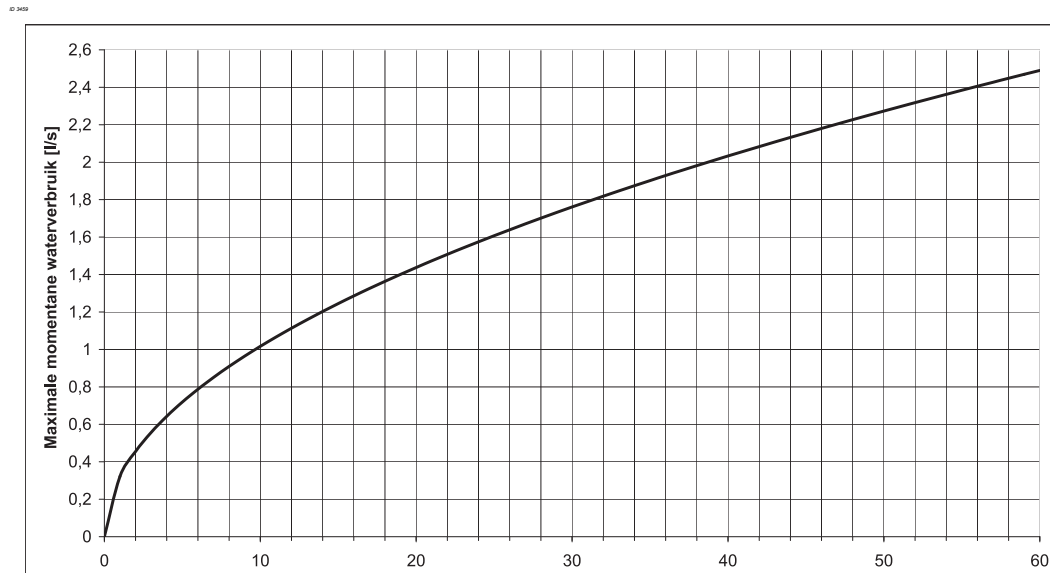


Figure 15: Number of apartments

ID 3459

6.2 Structure of article numbers

Table 10: Structure of article numbers

Structure of article numbers												
Unit type	Number of pumps	Pump type	Pump size	Stages	Reduced stages	Material + pressure class	Manifolds	Controlle	starting methode	Construction	Description	Design version
HU	1	2	3	4	5	6	7	8	9	10		
	1										1 pump	
	2										2 pumps	
		1									VME	
			2								2	B
			4								4	B
			6								6	B
				1							1 stage	
				2							2 stages	
				3							3 stages	
				4							4 stages	
				5							5 stages	
				6							6 stages	
					0							
						1					AISI 304 PN10	
							C				G 5/4	
							D				G 6/4	
								3			CC	
								6			FR	
									1		DOL	
									4		FRK	
										T	TWIN - CUBE	

dp pumps

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Translation of the original instructions

