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Japanese Technology since 1912

CVM

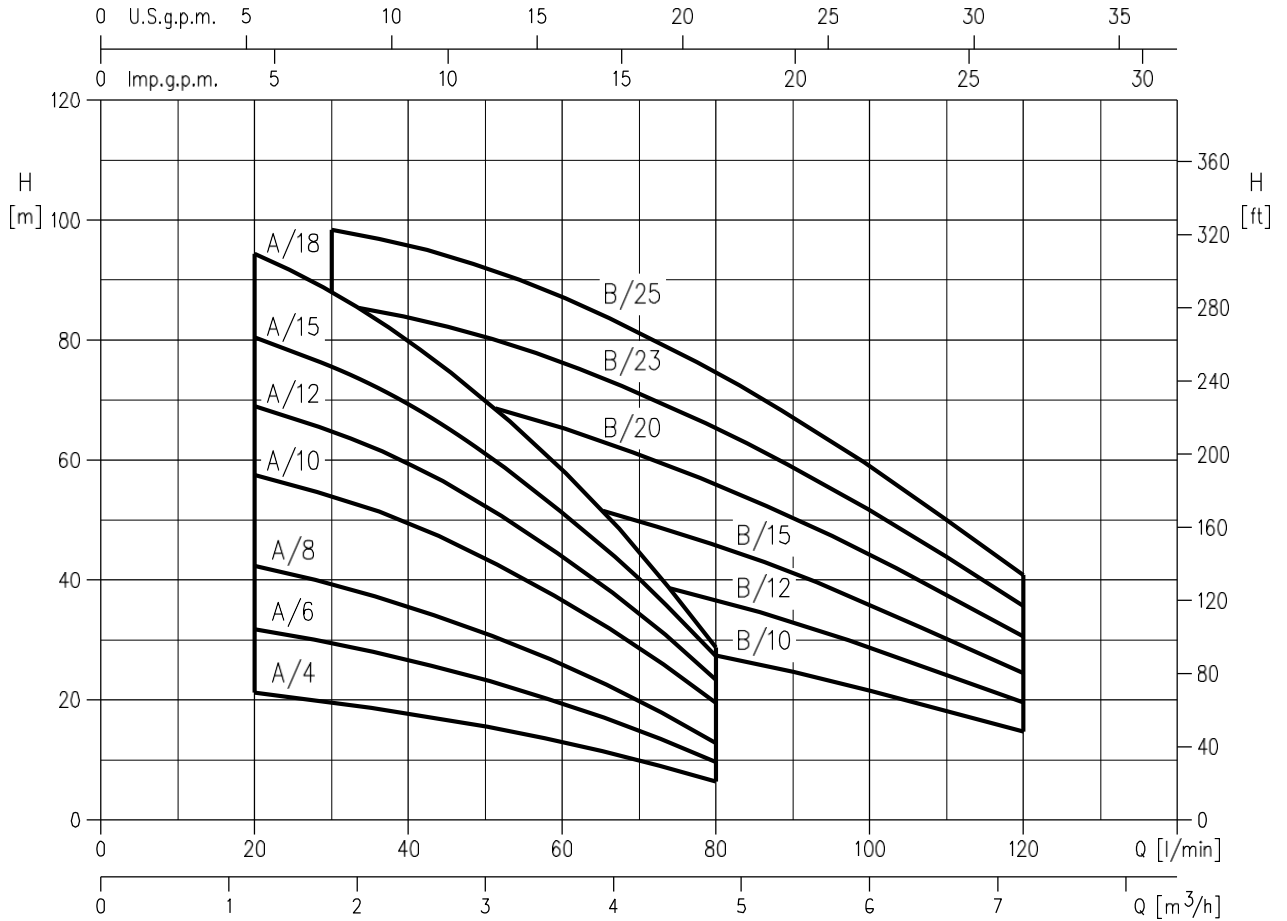
Data Book 50Hz



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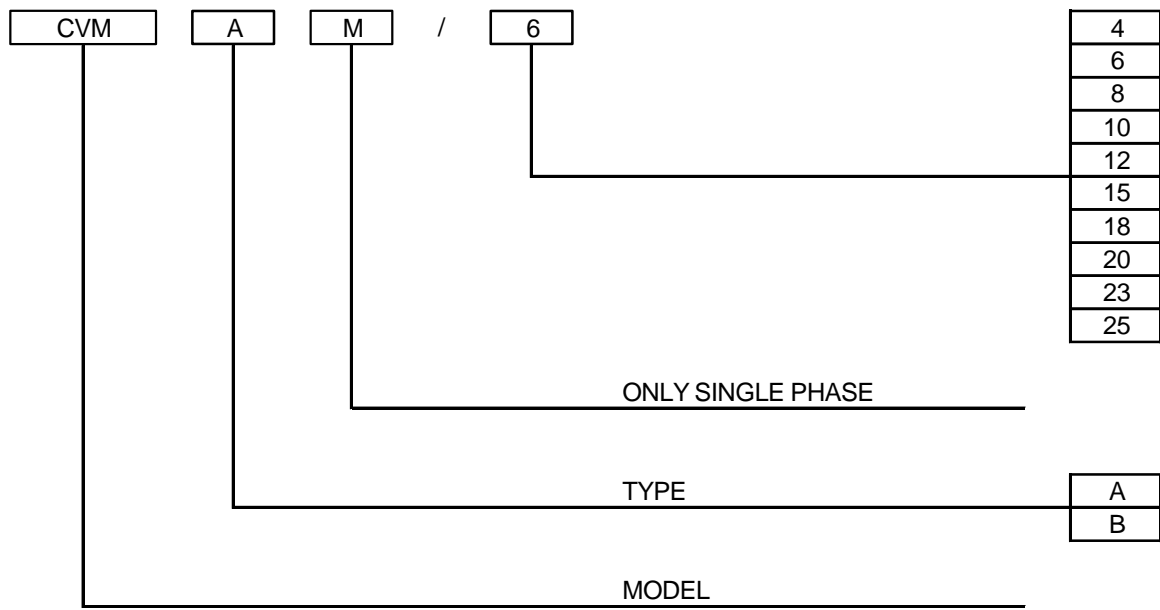
PUMP		
Liquid Handled	Type of liquid	Clean water
	Temperature [°C]	min. +5 max. +40
Maximum working pressure [MPa]		1.1
Construction	Impeller	Closed centrifugal
	Shaft seal type	Mechanical seal
	Bearing	Sealed ball bearing
Pipe Connection	Suction	G 1 ¹ / ₄ UNI ISO 228
	Discharge	G 1 ¹ / ₄ UNI ISO 228
Material	Casing	Cast iron
	Impeller	PPE+PS Glass fibre reinforced
	Shaft seal	Ceramic/Carbon/NBR
	External pump casing	AISI 304
	Shaft	AISI 416
	Stages	PPE+PS Glass fibre reinforced /PTFE
	Diffuser	PPE+PS Glass fibre reinforced
Bracket	Cast iron	
Applicable standard of test		ISO 9906 – Annex A

MOTOR		
Type	Electric asynchronous- TEFC	
	Single Phase	Three Phase
Efficiency level (Reg. 1781/2019)	IE2	IE3
No. of Poles	2	
Rotation speed [min ⁻¹]	≈ 2850	
Insulation Class	F	
Protection degree (CEI EN 60034-5)	IP 44	
Power rating	[kW]	0.3 ÷ 1.7
	[HP]	0.4 ÷ 2.3
Frequency [Hz]	50	
Voltage [V]	230 ±10%	230/400 ±10%
Capacitor	Built in	-
Over load protection	Built in	Provided by the user
Casing material	Aluminium	
Dimensions of cable entry	PG 11 – PG 13.5 - M16x1.5 – M20x1.5 (see pag. 400)	



Pump type		Q=Capacity									
		l/min	20	30	40	50	60	80	100	120	
Single Phase	Three Phase	0	1,2	1,8	2,4	3	3,6	4,8	6	7,2	
		H=Total manometric head in meters									
CVM AM/4	CVM A/4	23,8	21,2	19,7	17,8	15,6	13,0	6,4	-	-	
CVM AM/6	CVM A/6	35,7	31,8	29,5	26,7	23,3	19,4	9,6	-	-	
CVM AM/8	CVM A/8	47,5	42,5	39,4	35,6	31,1	25,9	12,8	-	-	
CVM AM/10	CVM A/10	62,5	57,5	54,0	49,5	43,5	36,6	19,5	-	-	
CVM AM/12	CVM A/12	75,0	69,0	65,0	59,5	52,5	44,0	23,4	-	-	
CVM AM/15	CVM A/15	87,5	80,5	75,5	69,5	61,0	51,0	27,3	-	-	
CVM AM/18	CVM A/18	103,0	94,5	88,0	80,0	70,0	58,5	28,8	-	-	
CVM BM/10	CVM B/10	38,1	-	36,2	35,1	33,7	32,0	27,5	21,6	14,7	
CVM BM/12	CVM B/12	51,0	-	48,0	46,8	45,0	42,6	36,6	28,8	19,6	
CVM BM/15	CVM B/15	63,5	-	60,5	58,5	56,2	53,3	45,8	36,0	24,5	
CVM BM/20	CVM B/20	78,5	-	74,0	72,0	69,0	65,5	56,0	44,5	30,6	
CVM BM/23	CVM B/23	91,5	-	86,0	84,0	80,5	76,5	65,5	51,5	35,7	
-	CVM B/25	105,0	-	98,5	96,0	92,0	87,0	74,5	59,0	41,0	

TYPE KEY



PERFORMANCE CURVE SPECIFICATIONS

The specifications below qualify the curves shown on the following pages.

Tolerances according to ISO 9906 Annex A

The curves refer to effective speed of asynchronous motors at 50 Hz

Measurements were carried out with clean water at 20°C of temperature and with a kinematic viscosity of $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt)

The NPSH curve is an average curve obtained in the same conditions of performance curves.

The continuous curves indicate the recommended working range. The dotted curve is only a guide.

In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

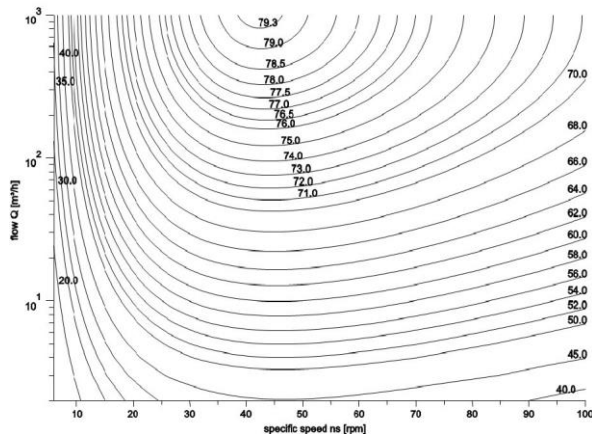
- Q = volume flow rate
- H = total head
- P_2 = pump power input (shaft power)
- η = pump efficiency
- NPSH = net positive suction head required by the pump
- MEI = minimum efficiency index

The minimum efficiency index (MEI) is a measure of the quality of a pump size in respect to its mean efficiency. The minimum efficiency index is based on the hydraulic efficiency and on the head at the best efficiency point.

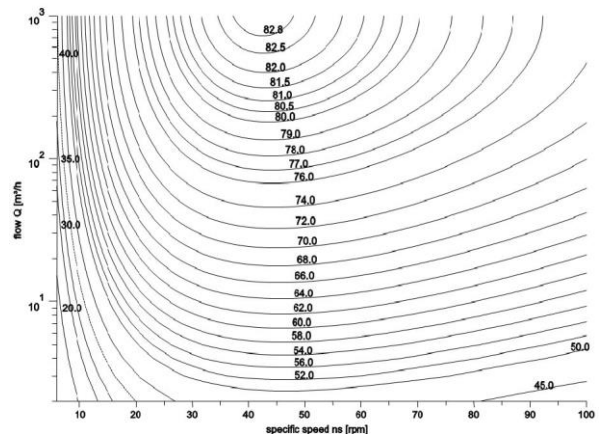
The efficiency of a pump with trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.

The operation of these water pumps with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.

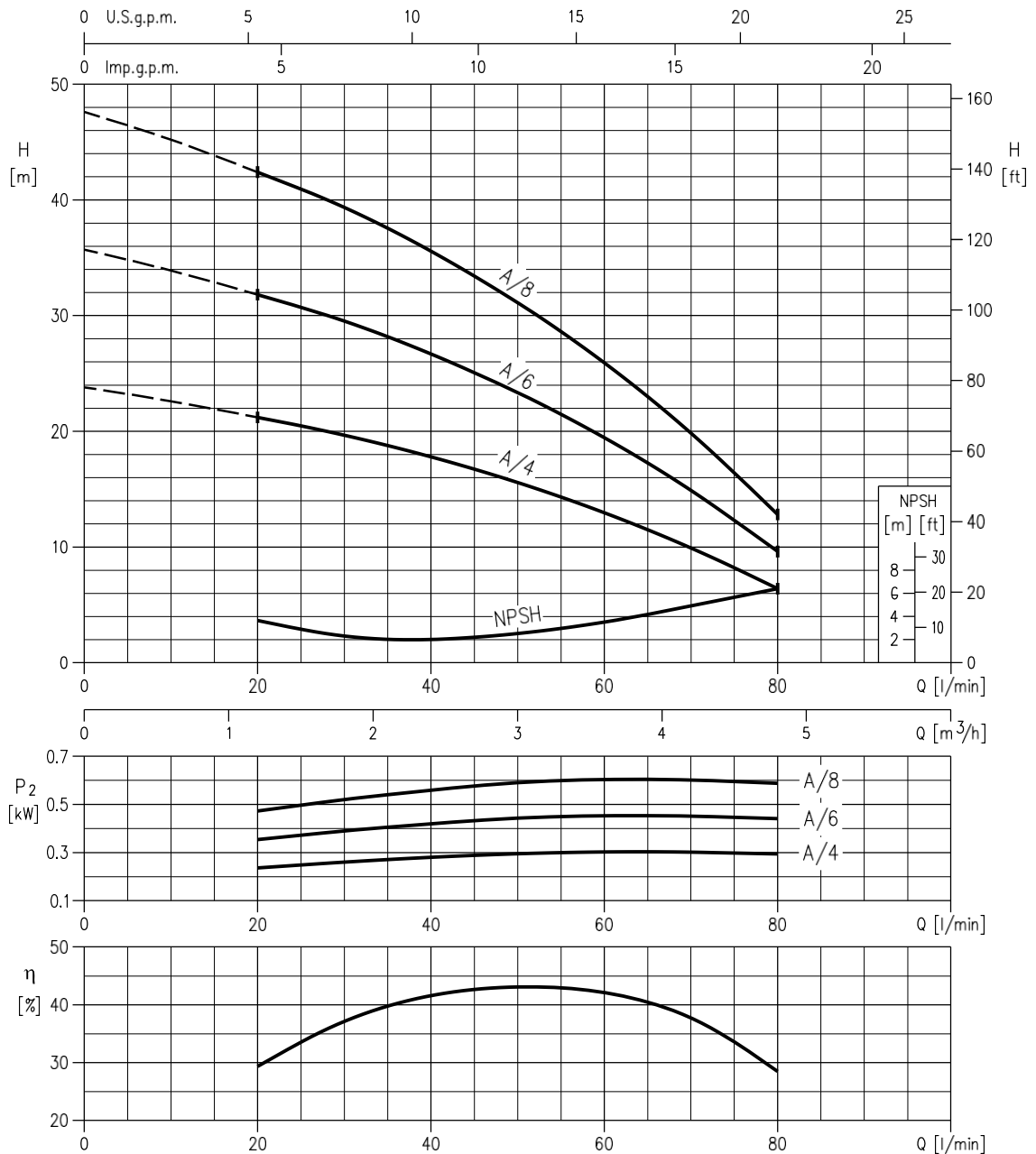
MEI = 0.4 for Multistage Vertical 2900rpm



MEI=0.7 for Multistage Vertical 2900 rpm

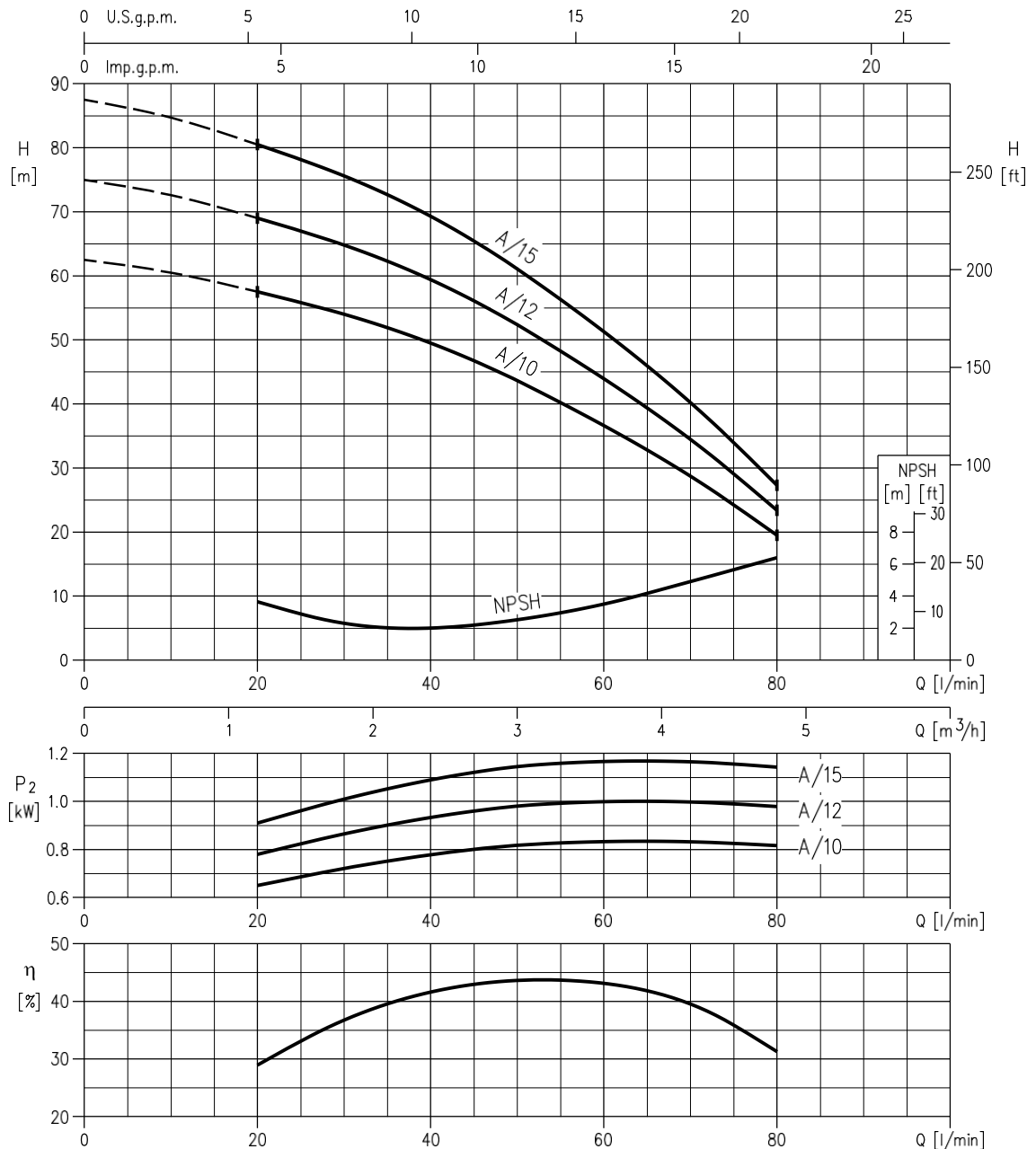


CVM A/4 MEI > 0.70 - Impeller diameter = 104 mm
 CVM A/6 MEI > 0.70 - Impeller diameter = 104 mm
 CVM A/8 MEI > 0.70 - Impeller diameter = 104 mm



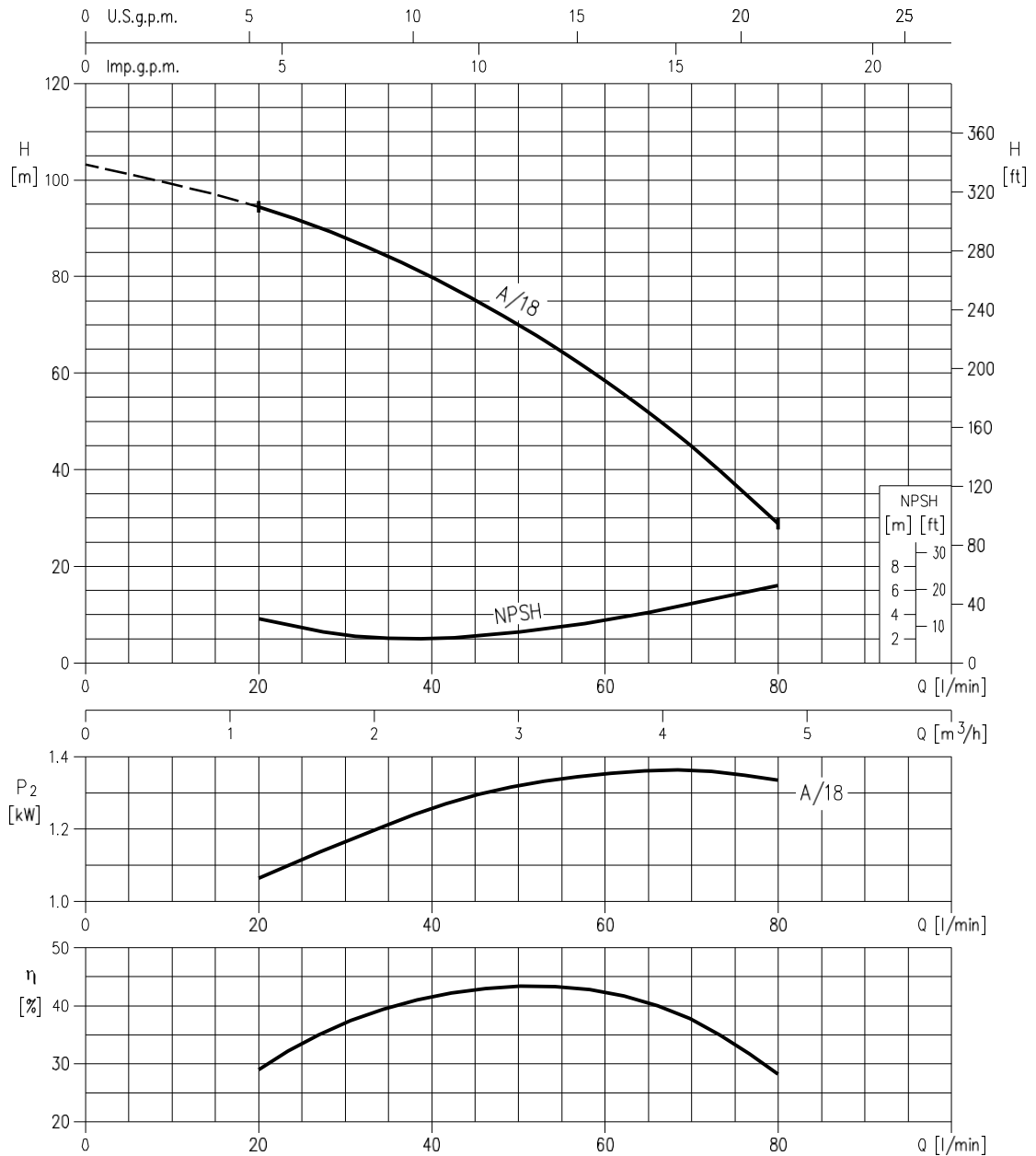
Rotation speed ≈ 2800 min⁻¹
 Test standard: ISO 9906 – Annex A

CVM A/10 MEI > 0.70 - Impeller diameter = 104 mm
CVM A/12 MEI > 0.70 - Impeller diameter = 104 mm
CVM A/15 MEI > 0.70 - Impeller diameter = 104 mm



Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

CVM A/18 MEI > 0.70 - Impeller diameter = 104 mm

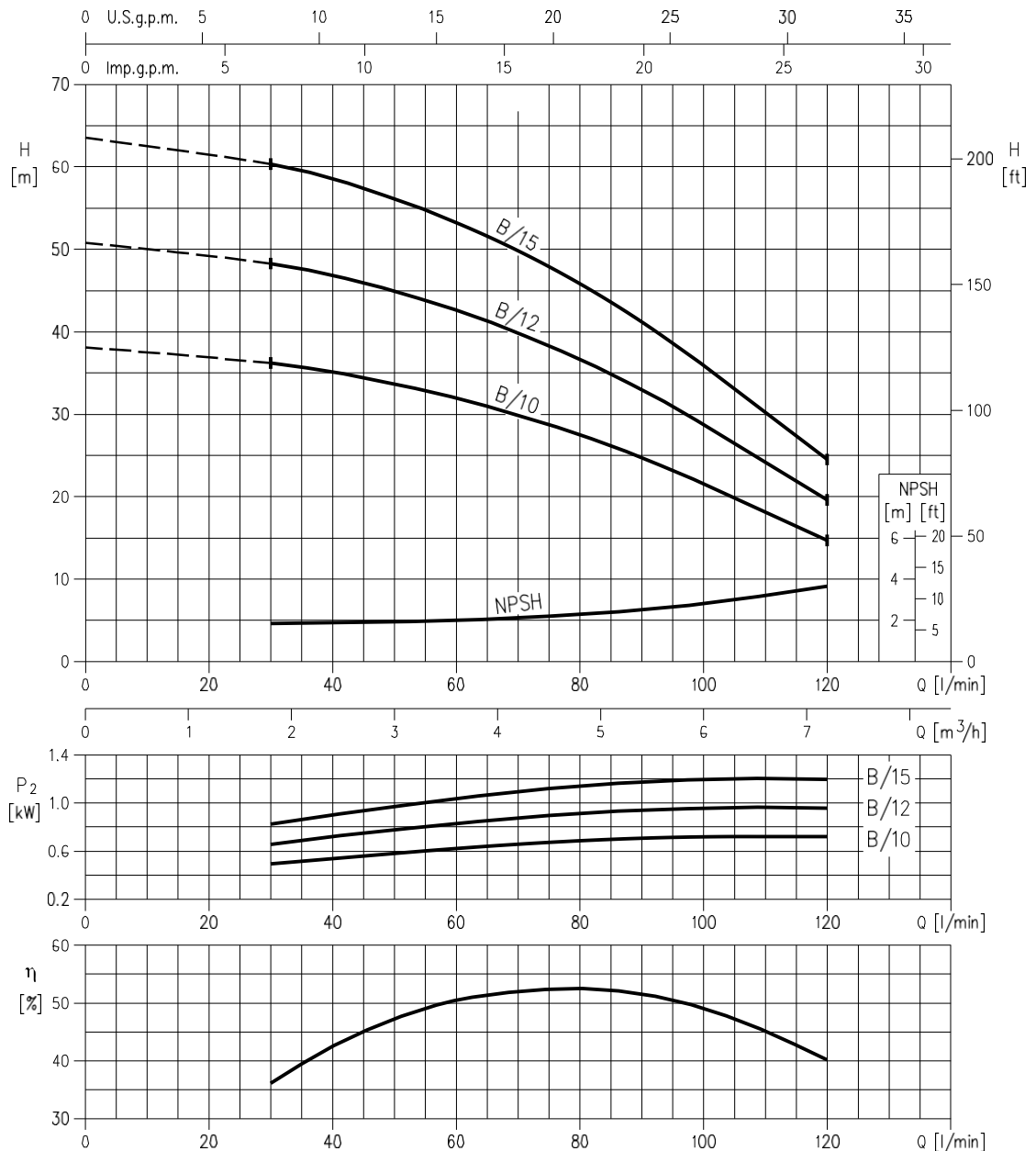


Rotation speed ≈ 2800 min⁻¹
 Test standard: ISO 9906 – Annex A



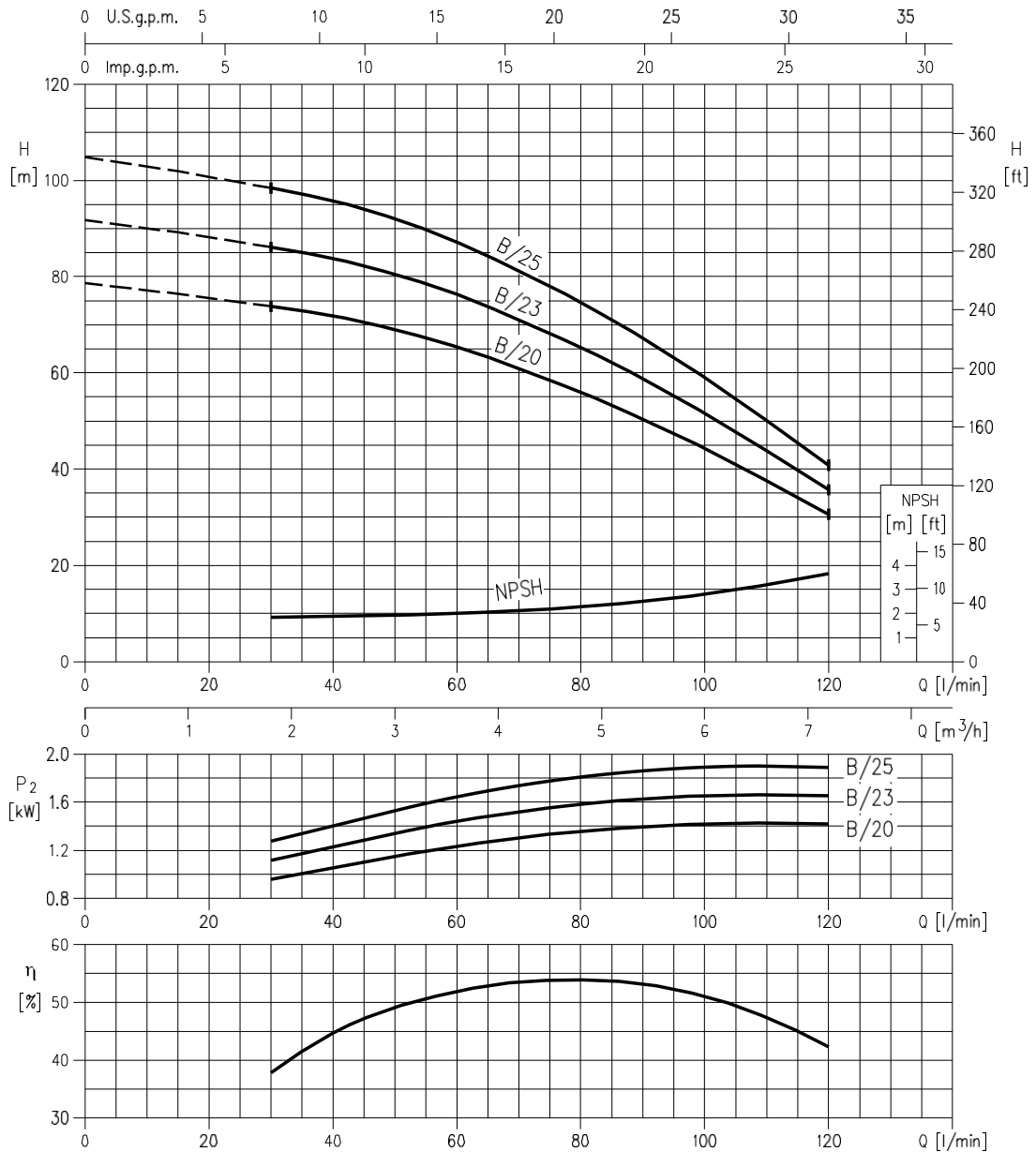
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CVM B/10 MEI > 0.70 - Impeller diameter = 102 mm
CVM B/12 MEI > 0.70 - Impeller diameter = 102 mm
CVM B/15 MEI > 0.70 - Impeller diameter = 102 mm



Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

CVM B/20 MEI > 0.70 - Impeller diameter = 102 mm
CVM B/23 MEI > 0.70 - Impeller diameter = 102 mm
CVM B/25 MEI > 0.70 - Impeller diameter = 102 mm

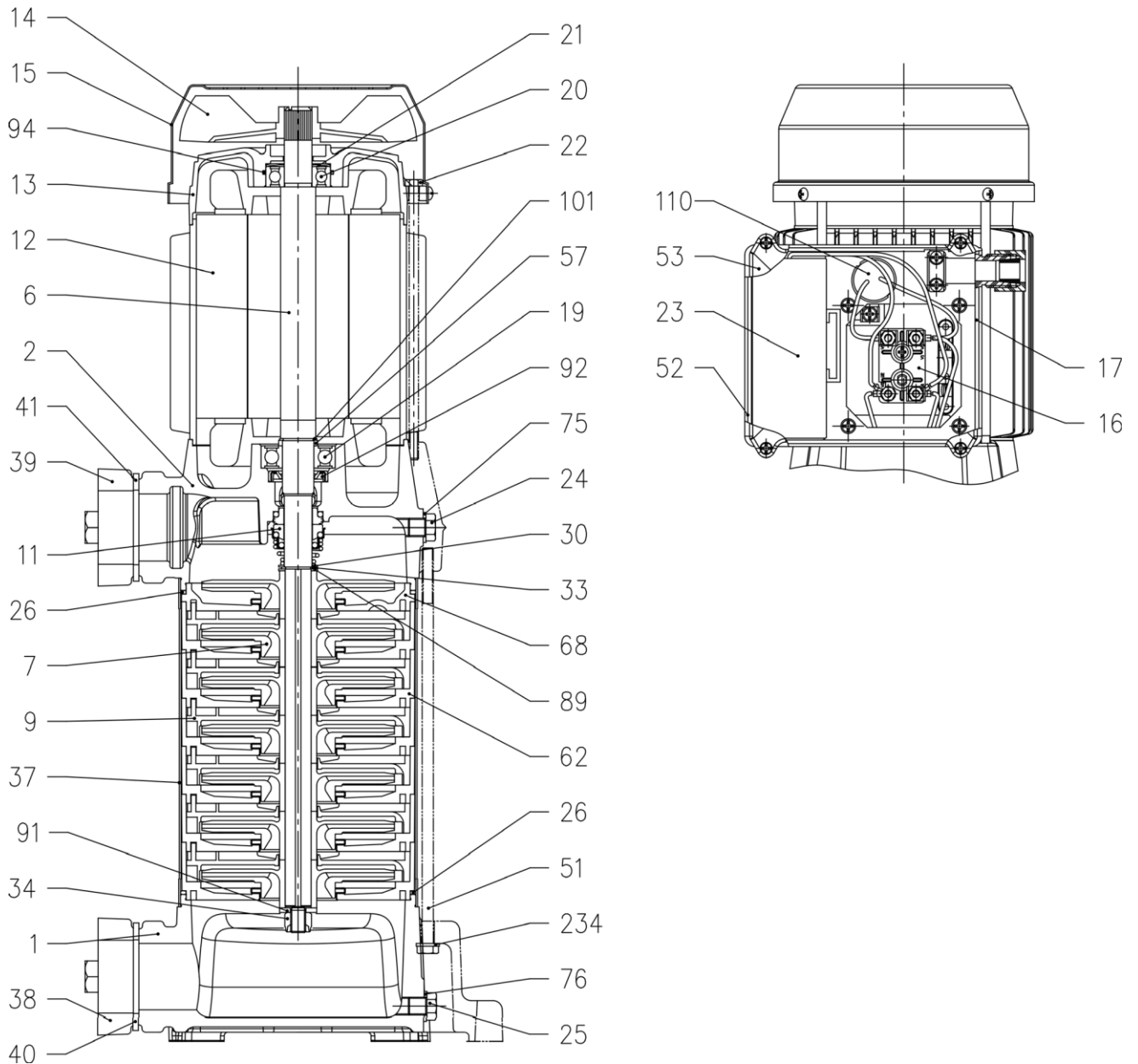


Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A



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SECTIONAL VIEW DRAWING



SECTIONAL VIEW TABLE

N°	PART NAME	MATERIAL	DIMENSIONS	STANDARD	Q.TY
1	Suction casing	Cast iron EN-GJL-200-EN 1561	-	-	1
2	Delivery casing	Cast iron EN-GJL-200-EN 1561	-	-	1
6	Shaft with rotor	EN 1.4005 (AISI 416)	-	-	1
7	Impeller	PPE+PS Glass fibre reinforced	-	-	[1]
9	Diffuser	PPE+PS Glass fibre reinforced	-	-	[1]
11	Mechanical seal [2]	Carbon / Ceramic / NBR	-	-	1
12	Motor frame with stator	-	-	-	1
13	Motor cover + Spacer [8]	Aluminium	-	-	1
14	Fan	PA	-	-	1
15	Fan cover	Galvanized Fe P04	-	-	1
16	Terminal board	-	-	-	1
17	Terminal box cover [3]	Aluminium	-	-	1
19	Pump side ball bearing	-	[4]	-	1
20	Fan side ball bearing	-	[4]	-	1
21	Adjusting ring	Steel C70	-	-	1
22	Motor tie rod	Galvanized Fe 42	M5xL	EBARA DRAWING	4
23	Capacitor [5]	-	-	-	1
24	Priming plug	OT 58 UNI 5705	G 1/8"	UNI ISO 228	1
25	Drain plug	OT 58 UNI 5705	G 1/8"	UNI ISO 228	1
26	O-ring	NBR	120x3	-	2
30	Washer	EN 1.4301 (AISI 304)	12x22x1 - [UP to 0,6kW] 15x22x1 - [0,75 kW and above]	EBARA DRAWING	1
33	Seeger ring	EN 1.4021 (AISI 420) EN 1.4301 (AISI 304)	12 14	UNI 7435 JIS B2804-1978	1
34	Impeller nut	EN 1.4301 (AISI 304)	M8x1 - [UP to 0,6kW] M10x1,25 - [0,75 kW and above]	UNI 7474	1
37	External pump casing	EN 1.4301 (AISI 304)	-	-	1
38	Counter flange	Cast iron EN-GJL-200-EN 1561	1"½	EBARA DRAWING	1
39	Counter flange	Cast iron EN-GJL-200-EN 1561	1"½	EBARA DRAWING	1
40	Counter flange gasket	NBR	-	EBARA DRAWING	1
41	Counter flange gasket	NBR	-	EBARA DRAWING	1
51	Tie rod	Galvanized Fe P04	M6	EBARA DRAWING	4
52	Capacitor box [5]	ABS class V-0	-	-	1
53	Capacitor box cover [5]	ABS class V-0	-	-	1
57	Pump side ball bearing spacer [6]	Steel C40	22x27x3	EBARA DRAWING	1
62	Stage housing	PPE+PS Glass fibre reinforced/PTFE	-	-	[1]
68	Stage	PPE+PS Glass fibre reinforced/PTFE	-	-	1
75	Washer	Aluminium	10x16x1,5	EBARA DRAWING	1
76	Washer	Aluminium	10x16x1,5	EBARA DRAWING	1
89	Washer	EN 1.4301 (AISI 304)	12x21x1 - [UP to 0,6kW] 14,1x22x1 - [0,75 kW and above]	EBARA DRAWING	1
91	Washer	EN 1.4301 (AISI 304)	8,4x17x1,6 - [UP to 0,6kW] 10,2x20x2,5 - [0,75 kW and above]	UNI EN ISO 7089 EBARA DRAWING	1
92	Lip seal	NBR	12x24x4 17x32x6	EBARA DRAWING	1
94	O-ring [9]	NBR	34.65x1.78	-	1
101	Seeger ring [6]	EN 1.4301 (AISI 304)	20	UNI 7435	1
110	Motor protector [7]	-	-	-	1
234	Washer	Galvanized steel	6,4x12,5x1,6	UNI EN ISO 7089	4

- [1] See table below
 [2] See pag. 303
 [3] Only for three phase

- [4] See pag. 302
 [5] Only for single phase
 [6] Only for motor size 80

[7]

- Only for motor size 71 e 80 single phase version
 [8] Spacer – Only for A/8 3-model
 [9] Only for A/12, B/12, A/15, AM/15, B/15, BM/15 models

QUANTITY FOR MODEL

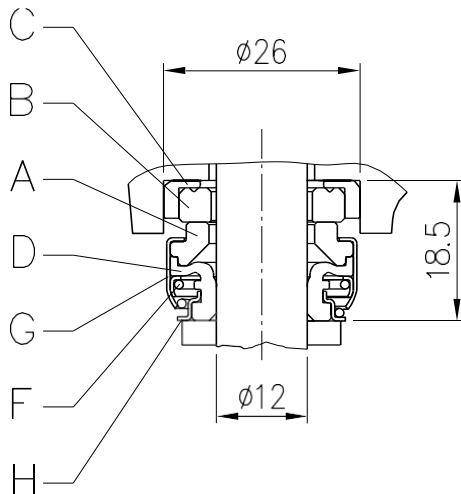
Pump		POS. 7	POS. 9	POS. 62
A type	B type			
CVM A/4	-	2	1	1
CVM A/6	CVM B/10	3	2	2
CVM A/8	CVM B/12	4	3	3
CVM A/10	CVM B/15	5	4	4
CVM A/12	CVM B/20	6	5	5
CVM A/15	CVM B/23	7	6	6
CVM A/18	CVM B/25	8	7	7

BEARINGS

Type pumps		Ball Bearing	
Single Phase	Three Phase	Pump side	Fan side
CVM AM/4	CVM A/4	6201	6201
CVM AM/6	CVM A/6		
CVM AM/8	CVM A/8		
CVM AM/10	CVM A/10	6203	6202
CVM AM/12	CVM A/12		
CVM AM/15	CVM A/15		
CVM AM/18	CVM A/18	6304	6203
CVM BM/10	CVM B/10	6203	6202
CVM BM/12	CVM B/12		
CVM BM/15	CVM B/15		
CVM BM/20	CVM B/20	6304	6203
CVM BM/23	CVM B/23		
-	CVM B/25		

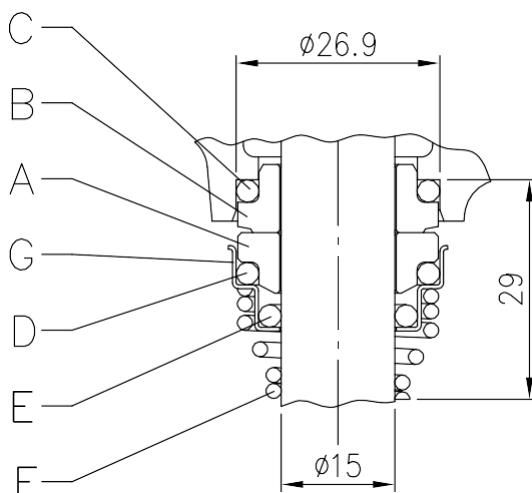
MECHANICAL SEAL

UP TO 0.6 KW



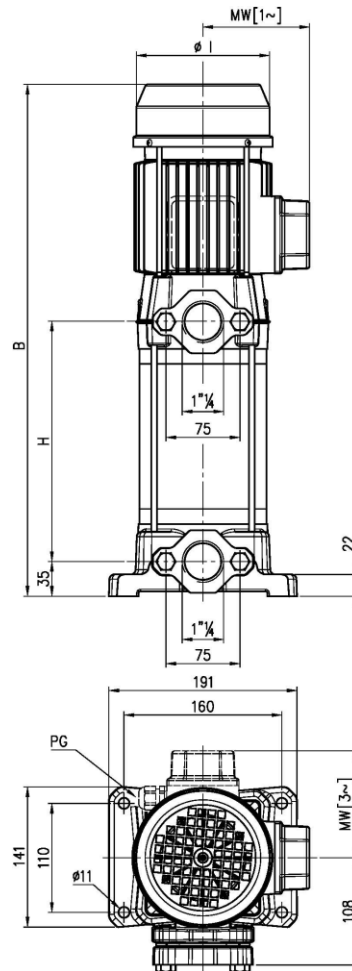
REF	PART NAME	MATERIAL product standard
A	Rotary seal ring	carbon graphite
B	Stationary seal ring	ceramic
C	Gasket	NBR
D	Bellows	NBR
F	Self driving spring	AISI 304
G	Frame	AISI 304
H	Retainer ring	AISI 304

0,75 KW AND ABOVE



REF	PART NAME	MATERIAL product standard
A	Rotary seal ring	ceramic
B	Stationary seal ring	carbon graphite
C	O Ring	NBR
D	O Ring	NBR
E	O Ring	NBR
F	Self driving spring	AISI 316
G	Frame	AISI 304

PUMP

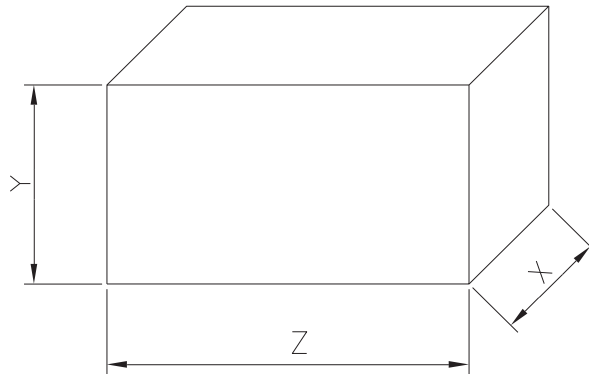


Pump type	B		H	Øl		MW		M	PG	Weight [kgf]	
	[1~]	[3~]		[1~]	[3~]	[1~]	[3~]			[1~]	[3~]
CVM A/4	336	336	112	124	141	101	91,5	PG11	11	11	11,1
CVM A/6	400	362	138	124		110,5		PG11		16	11,7
CVM A/8	426	406	164	141	141	110,5	101	PG11	11	16,5	12,8
CVM A/10	464	452	190					M16x1.5		17	16,6
CVM A/12	490	490	216	159	141	136	120,5	M16x1.5	13,5	17,5	18,4
CVM A/15	539	516	242					M16x1.5		22	18,6
CVM A/18	590	565	268	159	159	136	120,5	M20x1.5	13,5	23	22,7
CVM B/10	412	400	138	141	141	110,5	101	M16x1.5	11	16	15,9
CVM B/12	438	438	164					M16x1.5		17	17,5
CVM B/15	487	464	190	159	141	136	120,5	M16x1.5	13,5	22	17,9
CVM B/20	538	526	216					M20x1.5		22	23,7
CVM B/23	564	552	242	159	141	136	120,5	M20x1.5	13,5	24	24,3
CVM B/25	-	578	268					-		-	-

[1~] Single phase

[3~] Three phase

PACKING



Type pumps	Packing [mm]				Weight [kgf]			
	[1~]	X [3~]	Y	Z [1~]	[3~]	[1~]	[3~]	
CVM A/4	212	212	208	427	427	12	12,0	
CVM A/6						17	12,6	
CVM A/8				17,5	13,7			
CVM A/10				18	17,7			
CVM A/12				18,5	19,5			
CVM A/15	252	252		590	537	23	19,7	
CVM A/18				615		617	24	24,5
CVM B/10				212		212	420	427
CVM B/12	530	537			18		18,6	
CVM B/15	590				23		19,0	
CVM B/20	252	252	617		617		23	24,5
CVM B/23							25	25,4
CVM B/25				-		25,7		

[1~] Single phase

[3~] Three phase

MOTOR DATA

Pump type Single Phase	Power		Efficiency	Capacitor		Efficiency (% load)				Input [kW]	Full load current [A] 230 V	Locked rotor current [A] 230 V
	[kW]	[HP]		[μF]	[V]	η %			cos-φ			
						50%	75%	100%				
CVM AM4	0,37	0,5	IE2	12,5	450	60,0	67,8	69,8	0,92	0,55	2,6	9,6
CVM AM6	0,45	0,6	IE2	14	450	55,7	65,6	72,5	0,94	0,65	3,0	13,4
CVM AM8	0,55	0,75	IE2	20	450	62,3	70,4	74,8	0,93	0,75	3,5	18,9
CVM AM10	0,9	1,2	IE2	31,5	450	67,0	75,3	79,0	0,92	1,15	5,4	31,3
CVM AM12	0,9	1,2	IE2	31,5	450	67,0	75,3	79,0	0,92	1,15	5,4	31,3
CVM AM15	1,3	1,75	IE2	40	450	71,5	78,0	81,8	0,97	1,64	7,4	51,3
CVM AM18	1,3	1,75	IE2	40	450	71,5	78,0	81,8	0,97	1,64	7,4	51,3
CVM BM/10	0,9	1	IE2	31,5	450	67,0	75,3	79,0	0,92	1,15	5,4	31,3
CVM BM/12	0,9	1,2	IE2	31,5	450	67,0	75,3	79,0	0,92	1,15	5,4	31,3
CVM BM/15	1,3	1,75	IE2	40	450	71,5	78,0	81,8	0,97	1,64	7,4	51,3
CVM BM/20	1,5	2	IE2	40	450	69,8	76,6	81,3	0,92	1,90	9,0	65,2
CVM BM/23	1,5	2	IE2	40	450	69,8	76,6	81,3	0,92	1,90	9,0	65,2

Pump type Three Phase	Power		Efficiency	Efficiency (% load)			Input [kW]	Full load current		Locked rotor current	
	[kW]	[HP]		η %				[A]		[A]	
				50%	75%	100%		230 V	400 V	230 V	400 V
CVM A/4	0,3	0,4	IE3	70,2	73,1	74,5	0,51	1,7	1,0	7,1	4,1
CVM A/6	0,44	0,6	IE3	69,0	74,6	75,1	0,55	1,8	1,1	9,6	5,5
CVM A/8	0,6	0,8	IE3	74,6	77,9	78,3	0,71	2,5	1,4	13,0	7,5
CVM A/10	0,75	1	IE3	80,9	82,3	82,1	0,91	3,0	1,7	19,7	11,4
CVM A/12	0,9	1,2	IE3	81,7	83,1	82,4	1,34	4,3	2,5	28,8	16,6
CVM A/15	1,1	1,5	IE3	81,7	83,1	82,4	1,34	4,3	2,5	28,8	16,6
CVM A/18	1,3	1,8	IE3	83,0	85,8	85,6	1,77	2,9	1,7	47,4	27,4
CVM B/10	0,75	1	IE3	80,9	82,3	82,1	0,91	3,0	1,7	19,7	11,4
CVM B/12	0,9	1,2	IE3	81,7	83,1	82,4	1,34	4,3	2,5	28,8	16,6
CVM B/15	1,1	1,5	IE3	81,7	83,1	82,4	1,34	4,3	2,5	28,8	16,6
CVM B/20	1,5	2	IE3	82,7	86,1	87,0	1,72	6,6	3,8	66,6	38,4
CVM B/23	1,7	2,3	IE3	84,2	86,8	86,9	2,01	7,1	4,1	66,6	38,4
CVM B/25	1,85	2,5	IE3	83,0	84,4	83,8	2,63	8,1	4,7	59,0	34,3
CVM B/25	1,85	2,5	IE3	86,2	87,0	86,0	2,55	8,2	4,7	66,6	38,4

NOISE DATA

Pump type		L _{pA} - dB(A) *
Single Phase	Three Phase	
CVM AM/4	CVM A/4	53
CVM AM/6	CVM A/6	
CVM AM/8	CVM A/8	
CVM AM/10	CVM A/10	62
CVM AM/12	CVM A/12	
CVM AM/15	CVM A/15	
CVM AM/18	CVM A/18	67
CVM BM/10	CVM B/10	62
CVM BM/12	CVM B/12	
CVM BM/15	CVM B/15	
CVM BM/20	CVM B/20	67
CVM BM/23	CVM B/23	
-	CVM B/25	

* Mean value of several measures at 1m distance around
Tolerance ± 2.5 dB.



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