

EBARA



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SPECIFICATION

50Hz

Rev. D

PUMP		
Liquid Handled	Type of liquid	Water, moderate aggressive solutions , glycol solutions , moderate viscous fluids
	Temperature [°C]	min.-15 max.+85 (Standard) *WRAS - DM174 max.+110 (High temperature) *DM174
Max chlorine content		500 ppm
Maximum working pressure [MPa]		1
Construction	Impeller	Closed centrifugal type
	Motor bearings	Screened ball bearing – greased for life
	Pump bearings	n° 7-8-9 impellers (Matrix 3-5) n° 6 impellers (Matrix 10) n° 5-6 impellers (Matrix 18) Type: Sleeve Shaft sleeve: Tungsten Carbide Bearing: Ceramic
Pipe Connection	Suction	G 1 (Matrix 3) UNI ISO 228
		G 1¼ (Matrix 5) UNI ISO 228
	Discharge	G 1½ (Matrix 10) UNI ISO 228
		G 2 (Matrix 18) UNI ISO 228
Material	Casing	EN 1.4301 (AISI 304)
	Impeller	EN 1.4301 (AISI 304)
	Intermediate casing	EN 1.4301 (AISI 304)
	O-Rings	EPDM
	Shaft seal	Ceramic/Carbon/EPDM
	Liner ring	EN 1.4301 (AISI 304) + PTFE
	Casing cover	EN 1.4301 (AISI 304)
	Shaft	EN 1.4301 (AISI 304) wet extension
Bracket	EN AB-AISI11Cu2(Fe) (Die cast Aluminium)	
Applicable standard of test		ISO 9906 – Annex A

* Approval for drinking water application
WRAS Approved product
DM174/2004



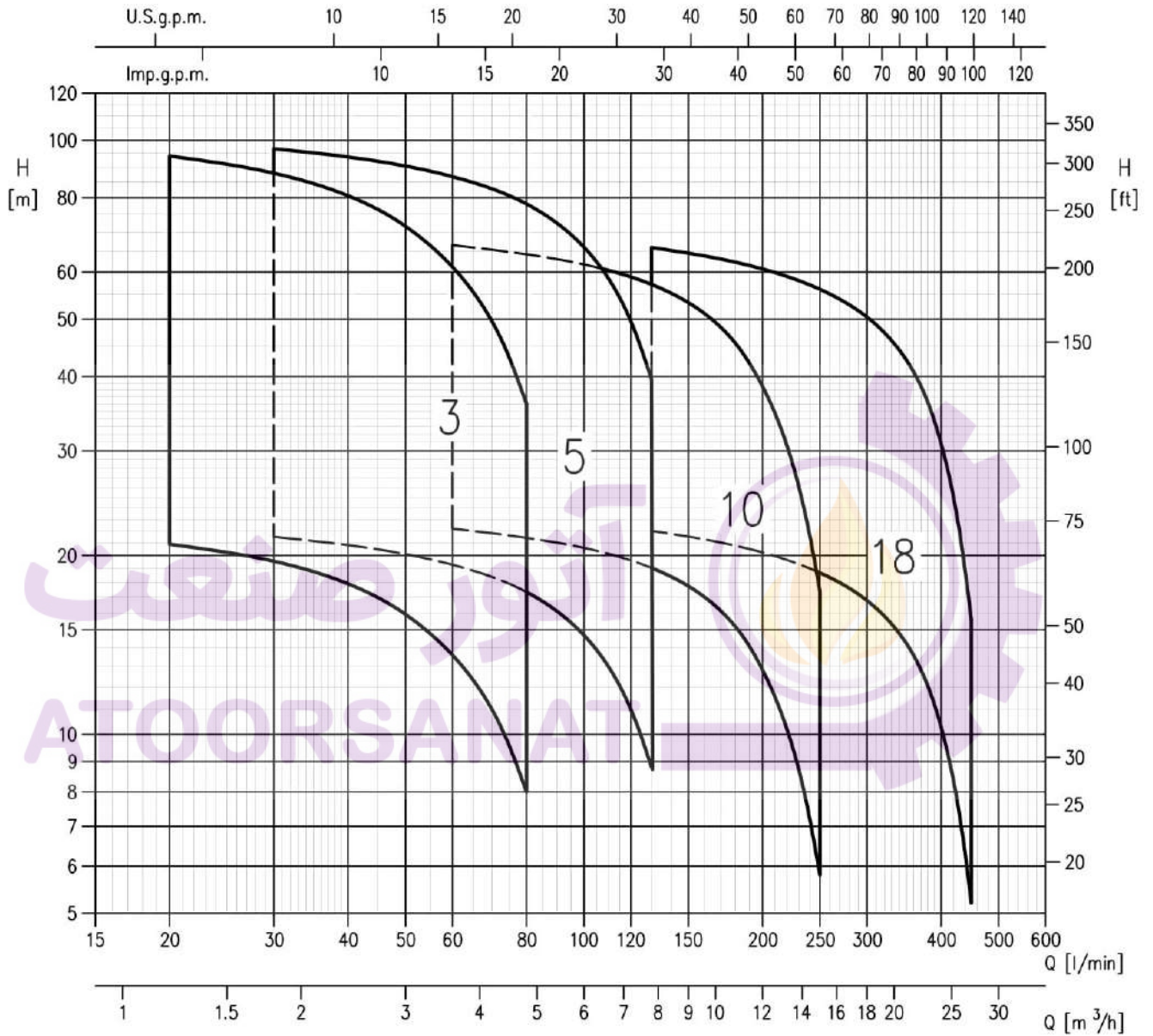


MOTOR		
Type	Electric - TEFC	
	Single Phase	Three Phase
Efficiency level (Reg. 640/2009)	-	- from 0.45 kW up to 0.65 kW IE2 from 0.75 kW up to 4.0 Kw IE3 from 0.75 kW up to 4.0 kW
No. of Poles	2	
Rotation speed [min ⁻¹]	≈ 2850	
Insulation Class	F	
Max temperature environment [°C]	40	
Protection degree (CEI EN 60034-5)	IP 55	
Power rating	[kW]	0.45 ÷ 2.2
	[HP]	0.6 ÷ 3.0
Frequency	[Hz]	50
	[V]	230 ±10%
Voltage		230/400 ±10%
Capacitor	Built in	-
Overload protection	Built in	Provided by the user
Casing material	Aluminium	
Base material / Motor support	Aluminium	
Dimensions of cable entry	PG11 – M20x1.5	PG11 – PG13.5 M16x1.5 – M20x1.5

SELECTION CHART

50Hz

Rev. D



SELECTION CHART

50Hz

Rev. D

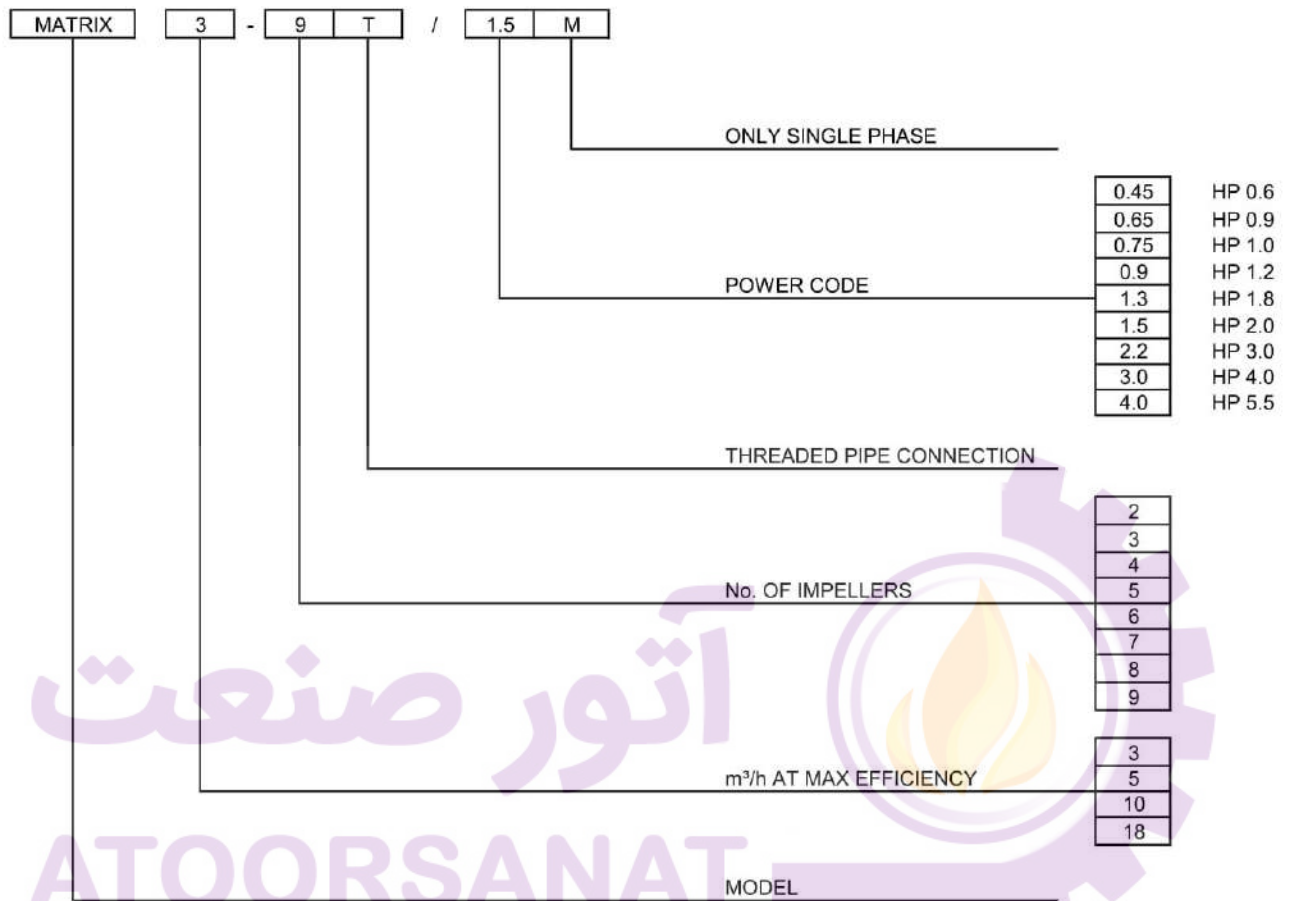
Pump type		Power		Q=Capacity																
Single phase	Three phase	[kW]	[HP]	l/min	0	20	30	45	60	80	100	130	160	200	250	300	350	400	450	
				m ³ /h	0	1.2	1.8	2.7	3.6	4.8	6	7.8	9.6	12	15	18	21	24	27	
				H=Total manometric head in meters																
3-2(.) / 0.45M	3-2(.) / 0.45	0.45	0.6	22.6	20.9	19.6	17.0	13.6	8.0											
3-3(.) / 0.65M	3-3(.) / 0.65	0.65	0.9	33.9	31.4	29.3	25.5	20.4	12.0											
3-4(.) / 0.65M	3-4(.) / 0.65	0.65	0.9	45.0	42.0	39.1	34.0	27.2	16.0											
3-5(.) / 0.75M	3-5(.) / 0.75	0.75	1.0	56.5	52.5	49.0	42.5	34.0	20.0											
3-6(.) / 0.9M	3-6(.) / 0.9	0.9	1.2	68.0	62.5	58.5	51.0	41.0	24.0											
3-7(.) / 1.3M	3-7(.) / 1.3	1.3	1.8	79.0	73.0	68.5	59.5	47.5	28.0											
3-8(.) / 1.3M	3-8(.) / 1.3	1.3	1.8	90.5	83.5	78.0	68.0	54.5	32.0											
3-9(.) / 1.5M	3-9(.) / 1.5	1.5	2.0	102.0	94.0	88.0	76.5	61.0	36.0											
5-2(.) / 0.45M	5-2(.) / 0.45	0.45	0.6	23.0	-	21.5	20.5	19.3	17.4	14.7	8.8									
5-3(.) / 0.65M	5-3(.) / 0.65	0.65	0.9	34.5	-	32.3	30.7	29.0	26.0	22.0	13.2									
5-4(.) / 0.9M	5-4(.) / 0.9	0.9	1.2	46.0	-	43.0	41.0	38.6	34.7	29.4	17.6									
5-5(.) / 1.3M	5-5(.) / 1.3	1.3	1.8	57.5	-	54.0	51.0	48.5	43.5	36.7	22.0									
5-6(.) / 1.3M	5-6(.) / 1.3	1.3	1.8	69.0	-	64.5	61.5	58.0	52.0	44.0	26.4									
5-7(.) / 1.5M	5-7(.) / 1.5	1.5	2.0	80.5	-	75.5	72.0	67.5	61.0	51.5	30.8									
5-8(.) / 2.2M	5-8(.) / 2.2	2.2	3.0	92.0	-	86.0	82.0	77.0	69.5	58.5	35.2									
5-9(.) / 2.2M	5-9(.) / 2.2	2.2	3.0	104.0	-	97.0	92.0	87.0	78.0	66.0	39.6									
10-2(.) / 0.75M	10-2(.) / 0.75	0.75	1.0	24.0	-	-	-	22.2	21.4	20.6	19.1	17.0	12.8	5.8						
10-3(.) / 1.3M	10-3(.) / 1.3	1.3	1.8	36.0	-	-	-	33.3	32.1	30.9	28.6	25.5	19.3	8.7						
10-4(.) / 1.5M	10-4(.) / 1.5	1.5	2.0	48.0	-	-	-	44.5	43.0	41.0	38.1	34.0	25.7	11.6						
10-5(.) / 2.2M	10-5(.) / 2.2	2.2	3.0	60.0	-	-	-	55.5	53.5	51.5	47.5	42.5	32.1	14.5						
10-6(.) / 2.2M	10-6(.) / 2.2	2.2	3.0	72.0	-	-	-	66.5	64.5	62.0	57.0	51.0	38.5	17.4						
18-2(.) / 1.5M	18-2(.) / 1.5	1.5	2.0	24.2	-	-	-	-	-	-	22.0	21.3	20.2	18.7	16.8	14.2	10.3	5.2		
18-3(.) / 2.2M	18-3(.) / 2.2	2.2	3.0	36.3	-	-	-	-	-	-	33.0	31.9	30.4	28.1	25.2	21.3	15.5	7.8		
-	18-4(.) / 3	3.0	4.0	48.5	-	-	-	-	-	-	44.0	42.5	40.5	37.4	33.6	28.4	20.6	10.4		
-	18-5(.) / 4	4	5.5	60.5	-	-	-	-	-	-	55.0	53.0	50.5	47.0	42.0	35.5	25.8	13.0		
-	18-6(.) / 4	4	5.5	72.5	-	-	-	-	-	-	66.0	64.0	60.5	56.0	50.5	42.5	30.9	15.6		

PERFORMANCE CURVE

50Hz

Rev. D

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 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

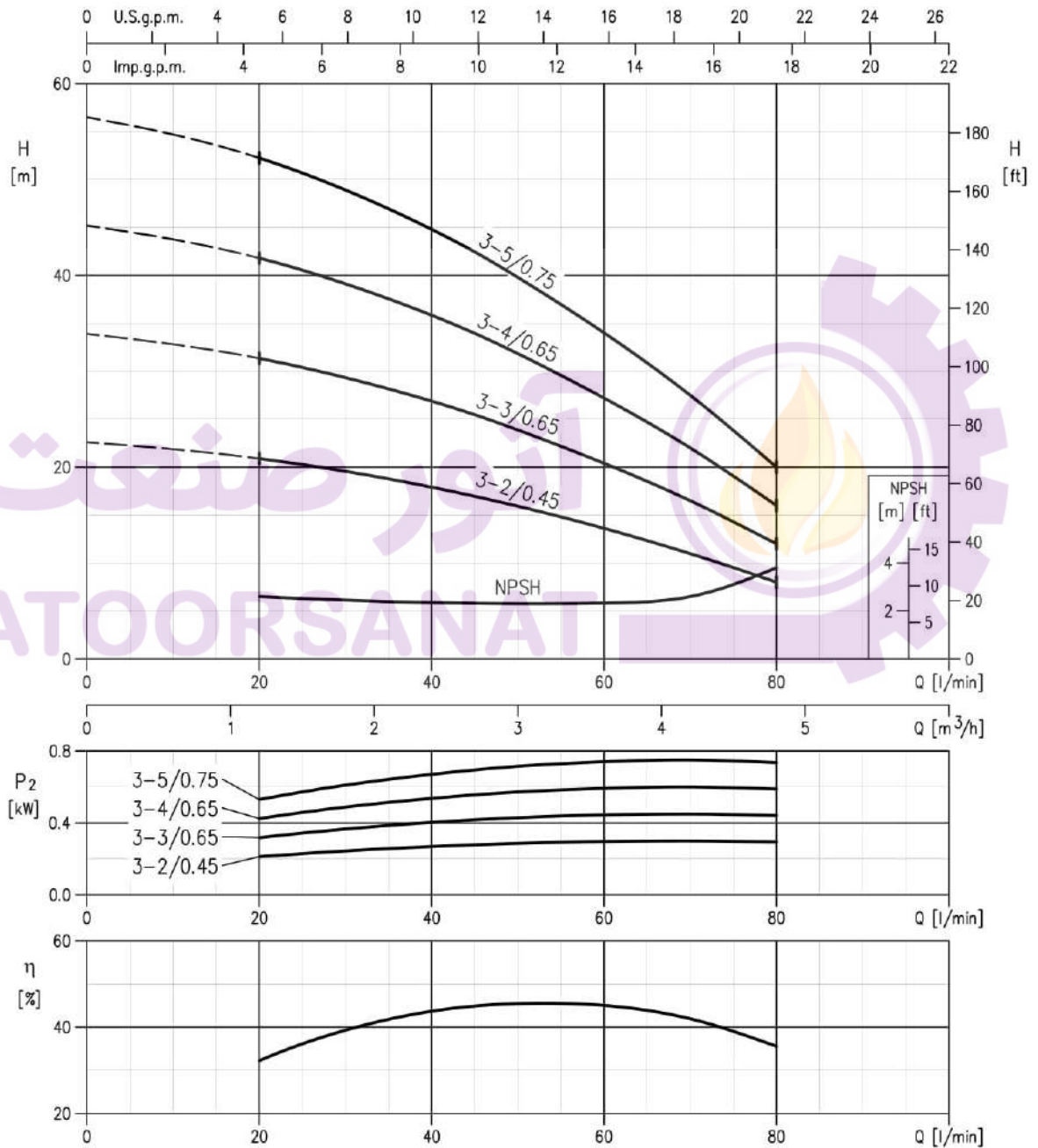
HORIZONTAL MULTISTAGE PUMPS

PERFORMANCE CURVE

50Hz

Rev. D

MATRIX 3-5/0.75 (0.75 kW) - Impeller diameter = 98.5 mm
MATRIX 3-4/0.65 (0.65 kW) - Impeller diameter = 98.5 mm
MATRIX 3-3/0.65 (0.65 kW) - Impeller diameter = 98.5 mm
MATRIX 3-2/0.45 (0.45 kW) - Impeller diameter = 98.5 mm



Rotation speed $\approx 2850 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

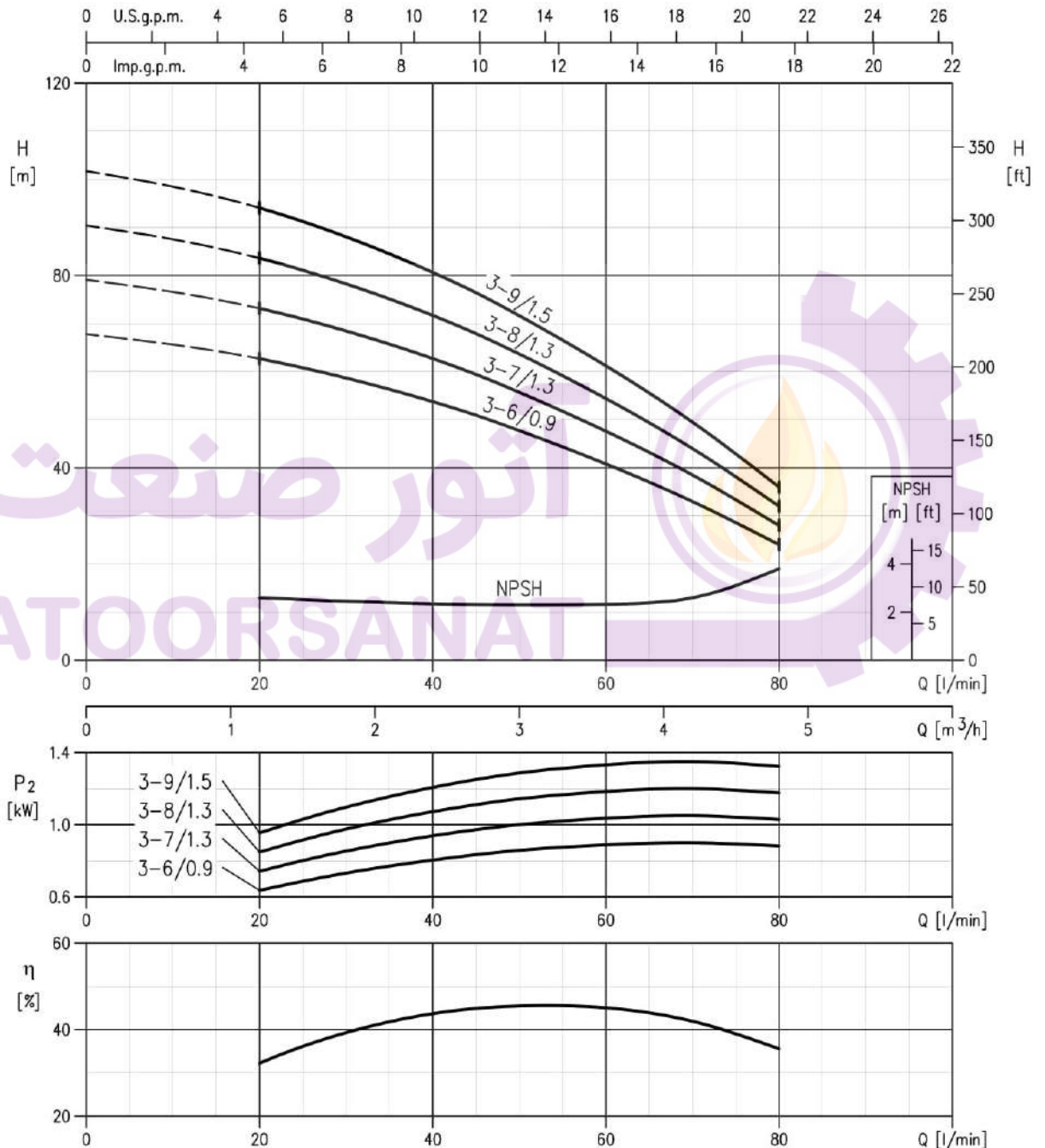
HORIZONTAL MULTISTAGE PUMPS

PERFORMANCE CURVE

50Hz

Rev. D

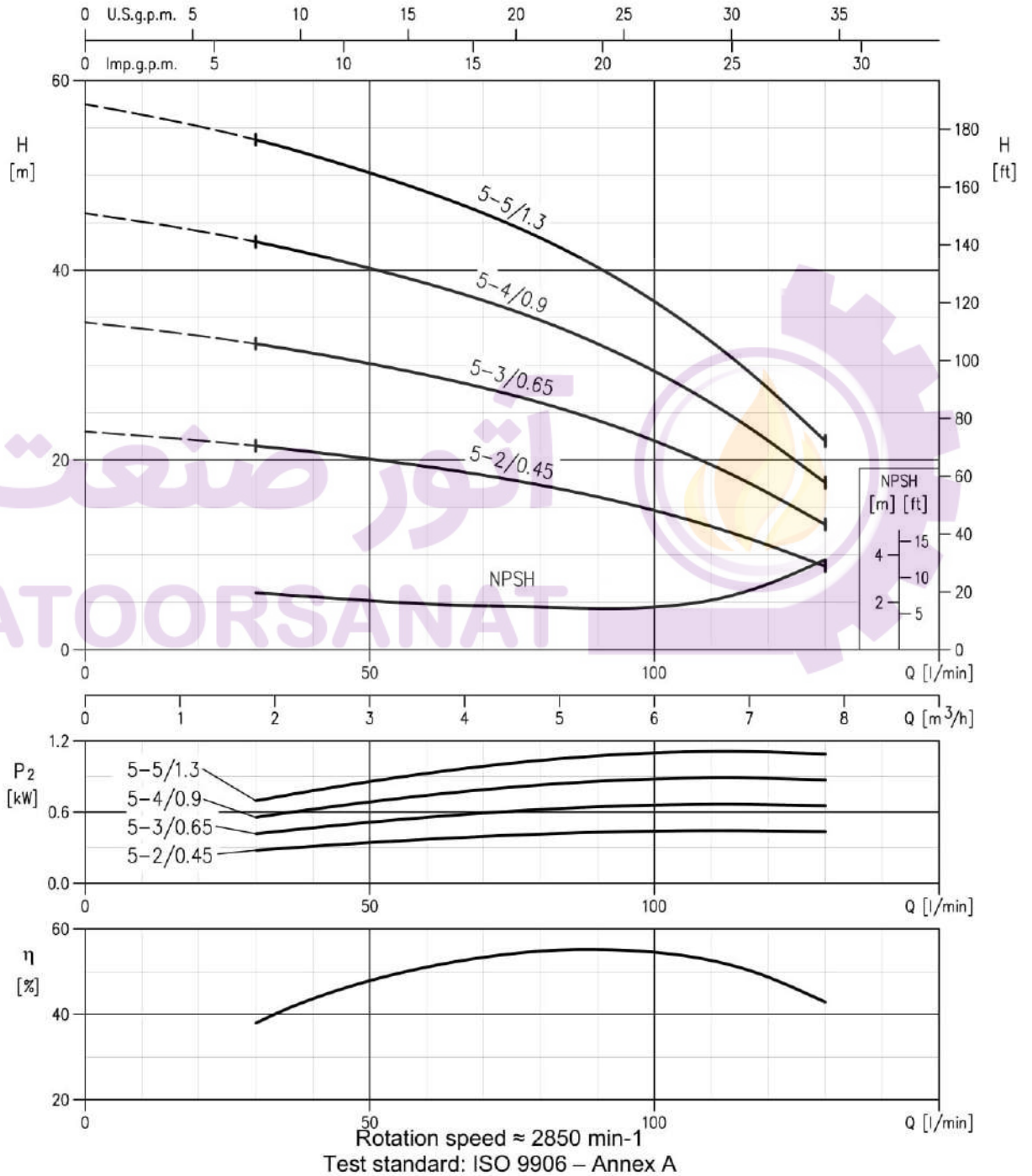
MATRIX 3-9/1.5 (1.5 kW) - Impeller diameter = 98.5 mm
MATRIX 3-8/1.3 (1.3 kW) - Impeller diameter = 98.5 mm
MATRIX 3-7/1.3 (1.3 kW) - Impeller diameter = 98.5 mm
MATRIX 3-6/0.9 (0.90 kW) - Impeller diameter = 98.5 mm



Rotation speed ≈ 2850 min⁻¹
 Test standard: ISO 9906 – Annex A



MATRIX 5-5/1.3 (1.3 kW) - Impeller diameter = 97 mm
MATRIX 5-4/0.9 (0.90 kW) - Impeller diameter = 97 mm
MATRIX 5-3/0.65 (0.65 kW) - Impeller diameter = 97 mm
MATRIX 5-2/0.45 (0.45 kW) - Impeller diameter = 97 mm



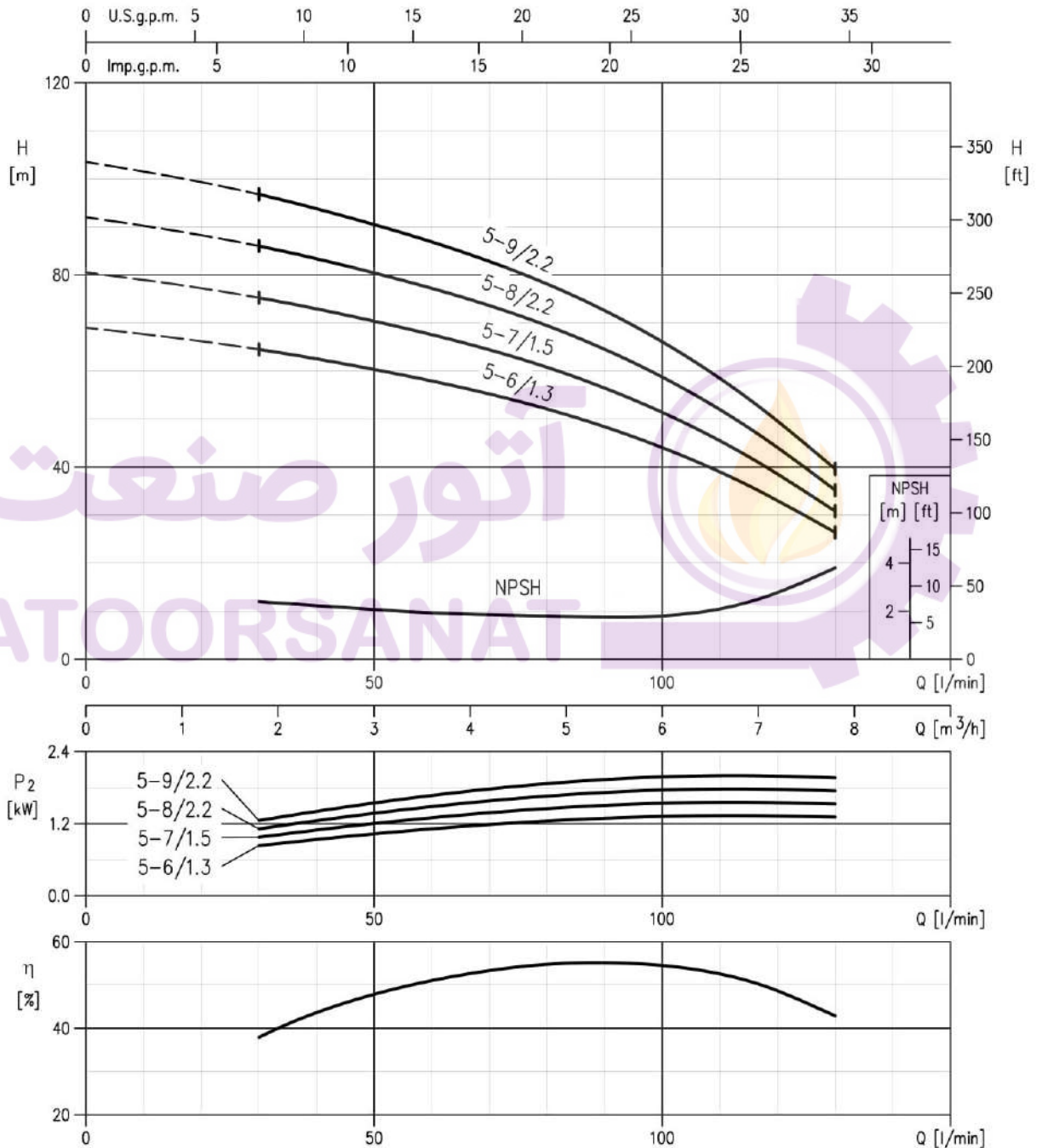
HORIZONTAL MULTISTAGE PUMPS

PERFORMANCE CURVE

50Hz

Rev. D

MATRIX 5-9/2.2 (2.2 kW) - Impeller diameter = 97 mm
MATRIX 5-8/2.2 (2.2 kW) - Impeller diameter = 97 mm
MATRIX 5-7/1.5 (1.5 kW) - Impeller diameter = 97 mm
MATRIX 5-6/1.3 (1.3 kW) - Impeller diameter = 97 mm



Rotation speed ≈ 2850 min⁻¹
 Test standard: ISO 9906 – Annex A

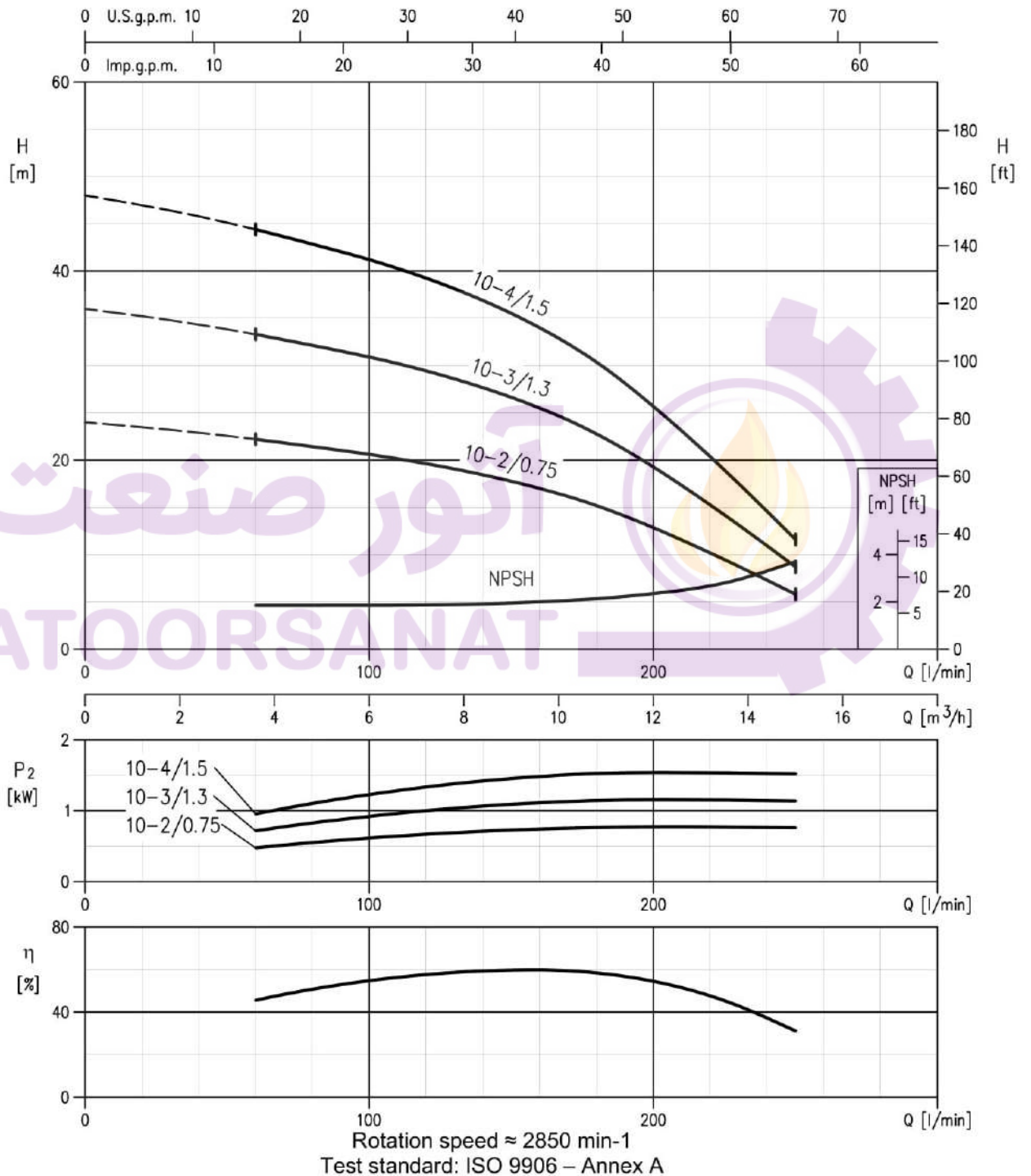
HORIZONTAL MULTISTAGE PUMPS

PERFORMANCE CURVE

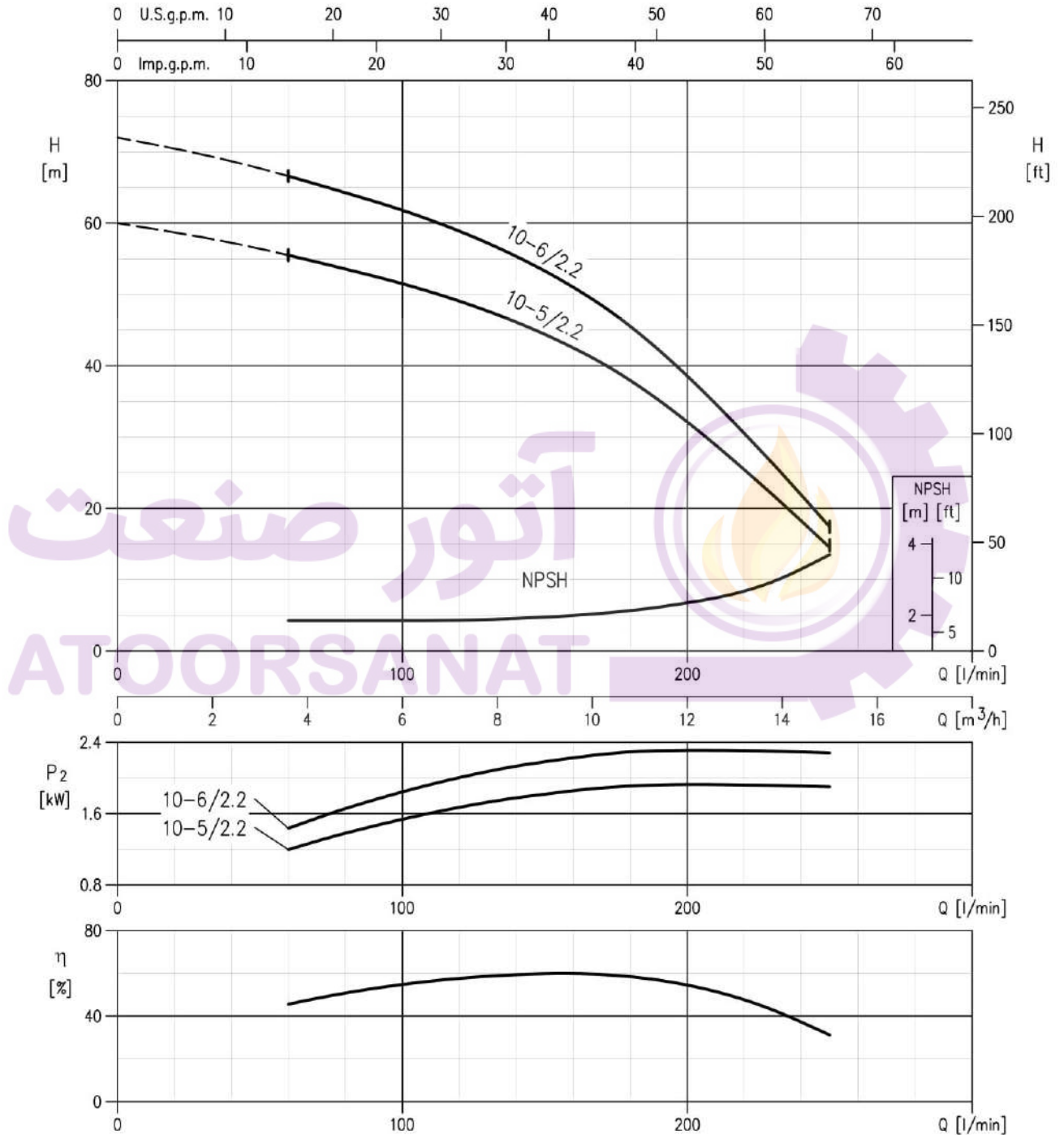
50Hz

Rev. D

MATRIX 10-4/1.5 (1.5 kW) - Impeller diameter = 100.5 mm
MATRIX 10-3/1.3 (1.3 kW) - Impeller diameter = 100.5 mm
MATRIX 10-2/0.75 (0.75 kW) - Impeller diameter = 100.5 mm



MATRIX 10-6/2.2 (2.2 kW) - Impeller diameter = 100.5 mm
 MATRIX 10-5/2.2 (2.2 kW) - Impeller diameter = 100.5 mm



Rotation speed ≈ 2850 min⁻¹
 Test standard: ISO 9906 – Annex A

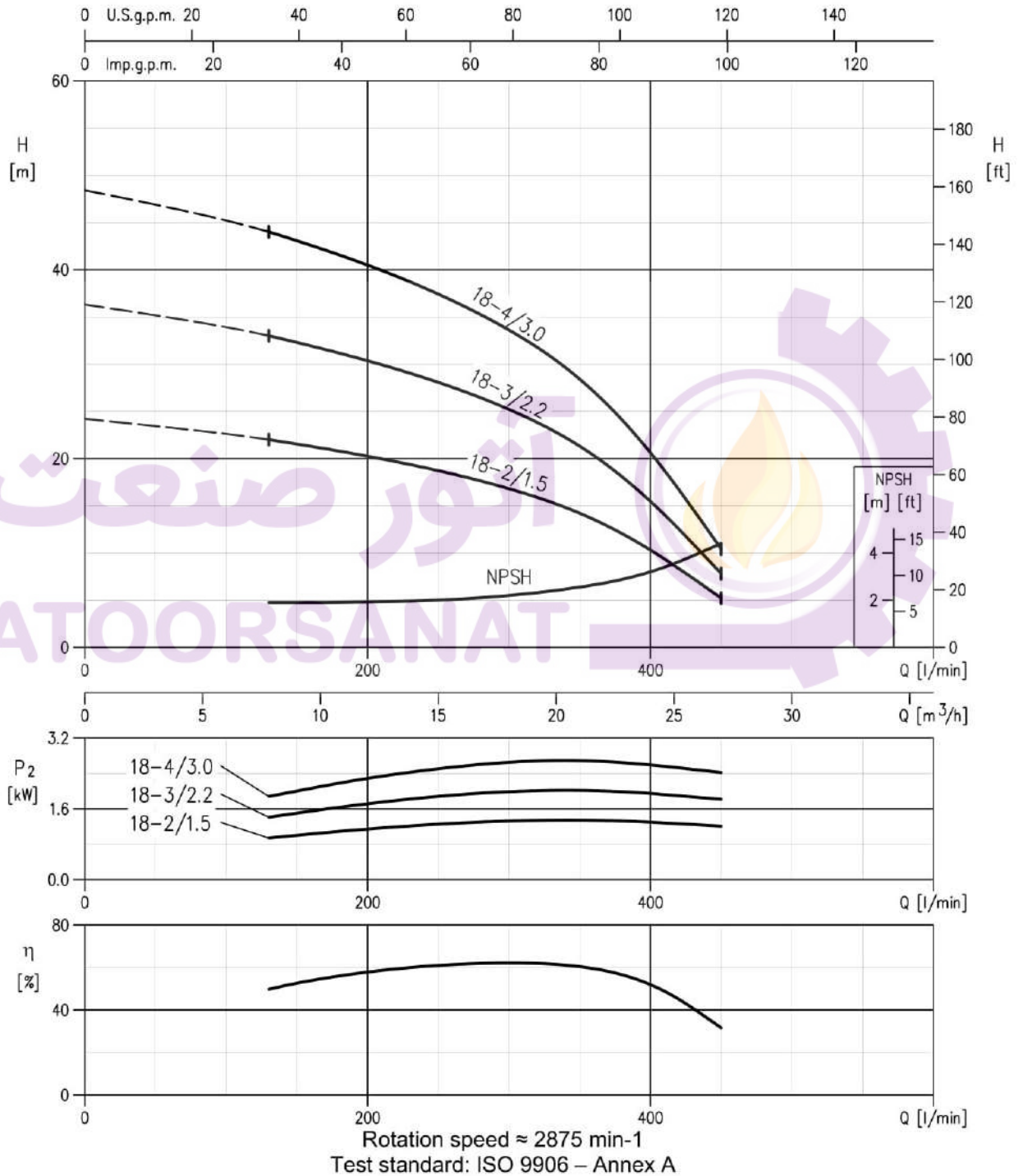
HORIZONTAL MULTISTAGE PUMPS

PERFORMANCE CURVE

50Hz

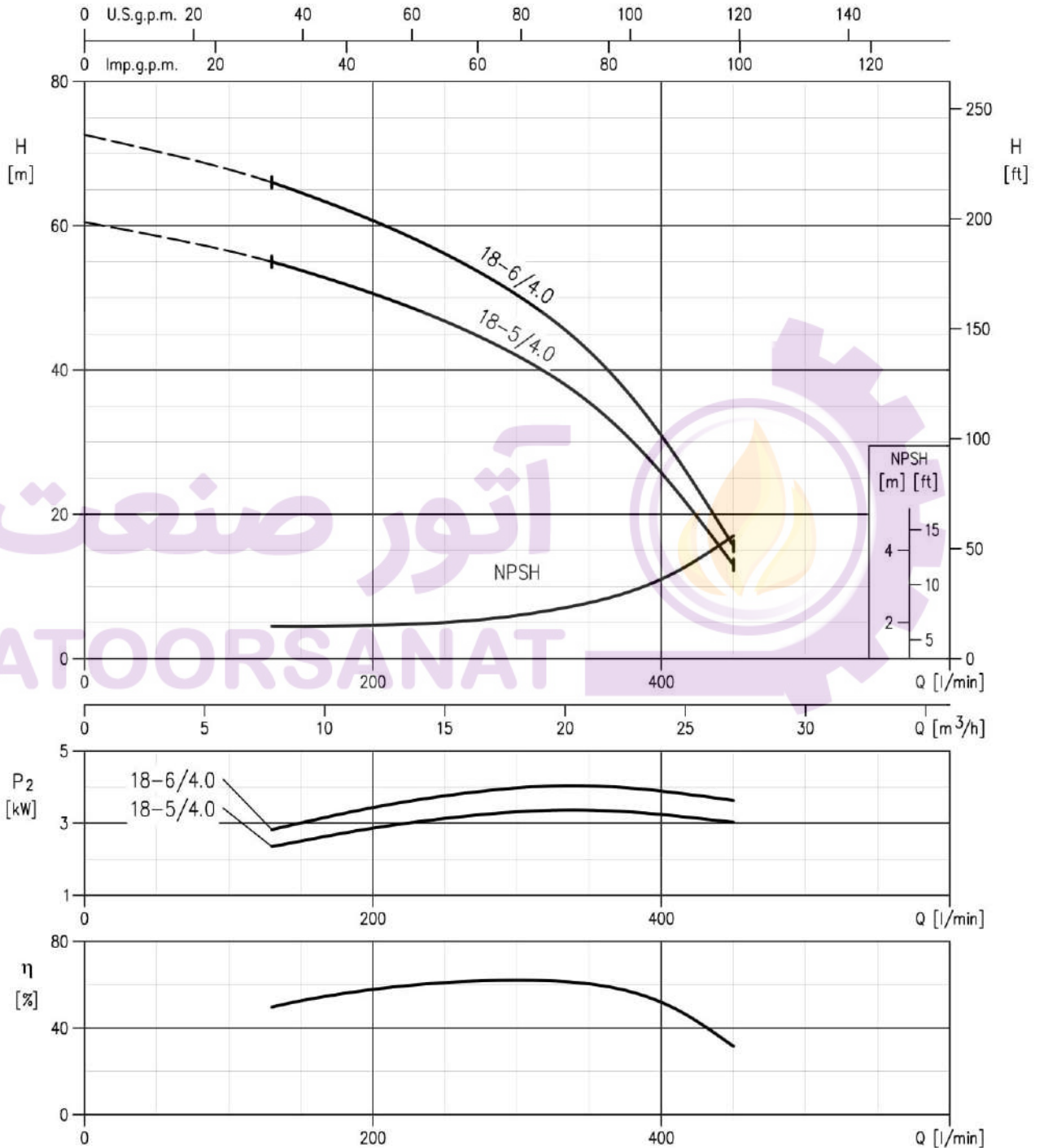
Rev. D

MATRIX 18-4/3.0 (3.0 kW) - Impeller diameter = 106.7 mm
MATRIX 18-3/2.2 (2.2 kW) - Impeller diameter = 106.7 mm
MATRIX 18-2/1.5 (1.5 kW) - Impeller diameter = 106.7 mm



MATRIX 18-6/4.0 (4.0 kW) - Impeller diameter = 106.7 mm

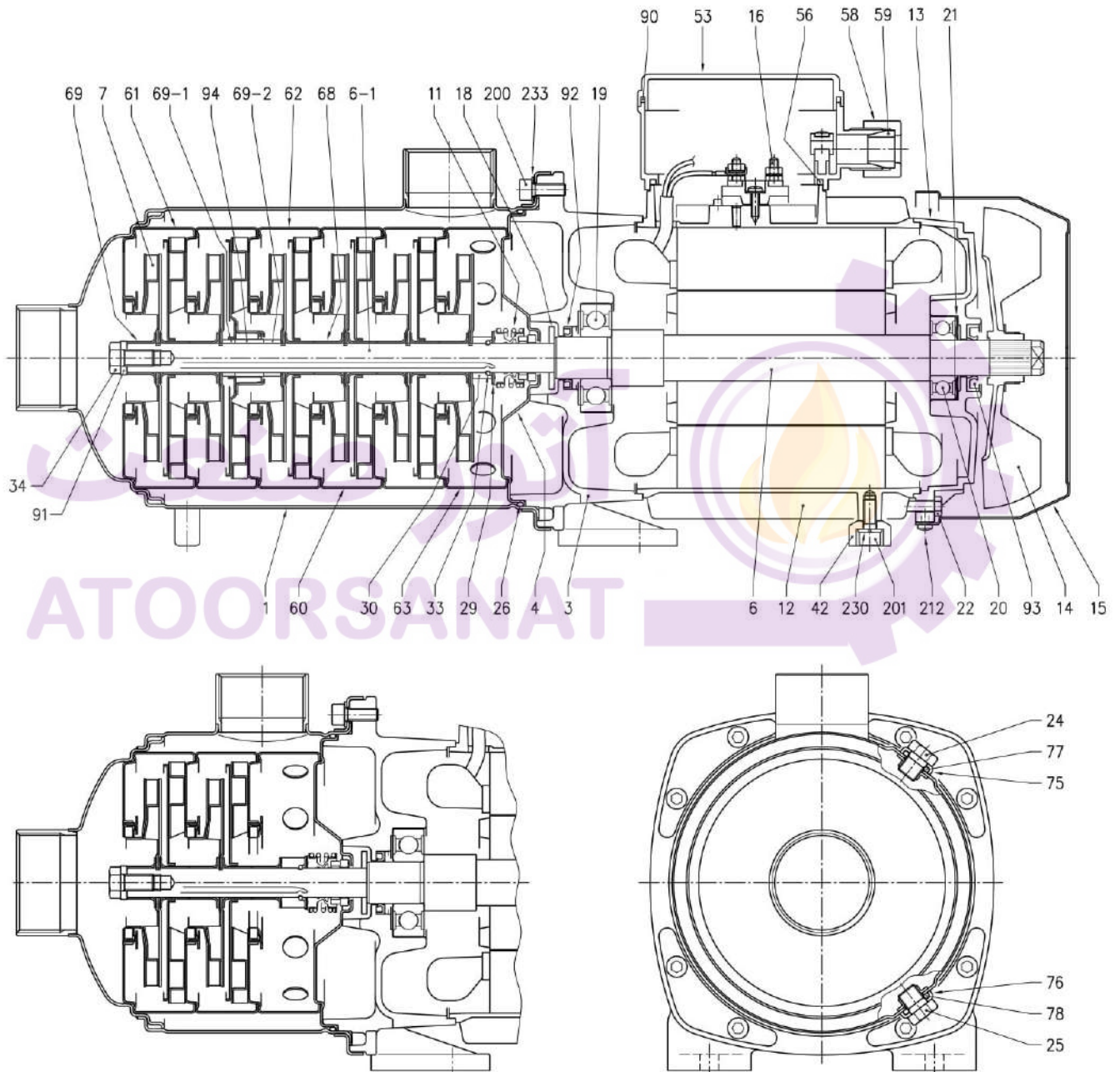
MATRIX 18-5/4.0 (4.0 kW) - Impeller diameter = 106.7 mm



Rotation speed ≈ 2850 min⁻¹
Test standard: ISO 9906 – Annex A

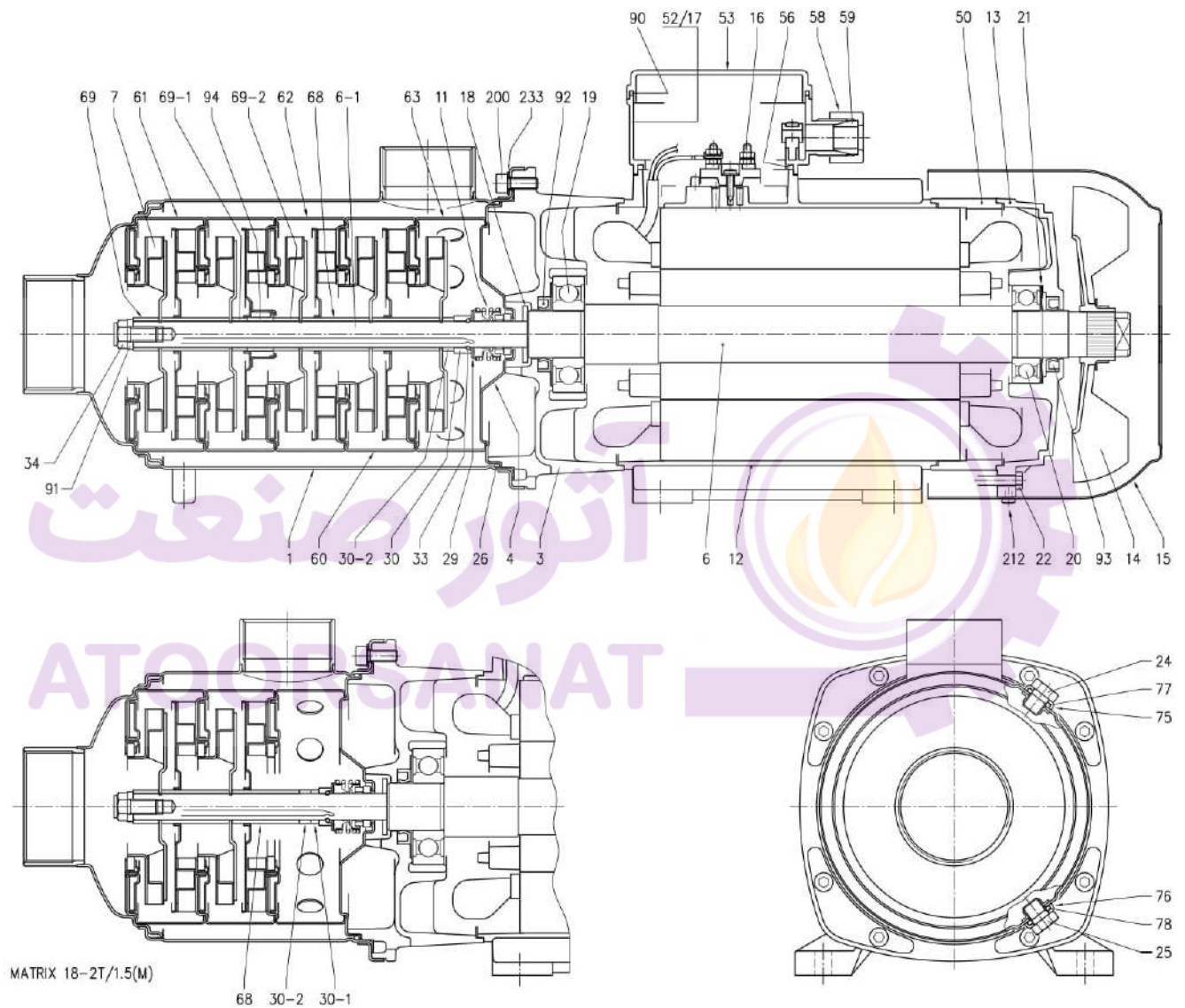
SECTIONAL VIEW DRAWING

MATRIX 3/5/10



VERSION FOR PUMP TYPE: MATRIX 3-2T/0.45(M)
MATRIX 5-2T/0.45(M)
MATRIX 10-2T/0.75(M)

MATRIX 18





SECTIONAL VIEW TABLE

N°	PART NAME	MATERIAL	DIMENSION	STANDARD	Q.TY
1	Casing	EN 1.4301 (AISI 304)			1
3	Bracket	EN AB-AISI11Cu2(Fe)			1
4	Casing cover	EN 1.4301 (AISI 304)			1
6	Shaft with rotor	-			1
6-1	Pump Shaft	EN 1.4301 (AISI 304)			1
7	Impeller	EN 1.4301 (AISI 304)			[1]
11	Standard mechanical seal	Ceramic/Carbon/EPDM	see table pag 304		1
	High temperature mechanical seal	Ceramic/Carbon/EPDM	see table pag 305		
12	Motor frame with stator	-			1
13	Motor cover	Aluminium			1
14	Fan	PA			1
15	Fan cover	Fe P04 Zincate			1
16	Terminal board	-			1
17	Terminal box cover	Aluminium			[1]
18	Splash ring	NBR	30x13.5x2.5		1
19	Bearing	-			1
20	Bearing	-			1
21	Adjusting ring	Steel C70			1
22	Tie rod	Fe 42 Zinc-coated			4
24	Plug	EN 1.4301 (AISI 304)			1
25	Plug	EN 1.4301 (AISI 304)			1
26	O-ring	EPDM			1
29	Washer	EN 1.4301 (AISI 304)	25.1x14x1		1
30	Ring holder	EN 1.4301 (AISI 304)			1
30-1	Shaft sleeve (adjustment)	EN 1.4301 (AISI 304)			[1]
30-2	Shaft sleeve (adjustment)	EN 1.4301 (AISI 304)			[1]
33	Ring	EN 1.4301 (AISI 304)			2
34	Screw	EN 1.4301 (AISI 304)	M 8x16	UNI 5739	1
42	Foot	Aluminium			[1]
50	Motor spacer [3]	Aluminium			1
52	Capacitor box [2]	ABS class V-0			1
53	Capacitor box cover [2]	ABS class V-0			1
56	Box gasket	NBR			1
58	Ring nut	-			[1]
59	Conic gasket	NBR			[1]
60	Intermediate casing	EN 1.4301 (AISI 304)+PTFE			[1]
61	Intermediate casing (suction)	EN 1.4301 (AISI 304)+PTFE			1
62	Intermediate casing (bearing)	EN 1.4301 (AISI 304)+PTFE + Ceramic			[1]
63	Intermediate casing (discharge)	EN 1.4301 (AISI 304)+PTFE			1
68	Shaft sleeve (intermediate)	EN 1.4301 (AISI 304)			[1]
69	Impeller spacer	EN 1.4301 (AISI 304)			1
69-1	Shaft sleeve (adjustment) [1]	EN 1.4301 (AISI 304)			[1]
69-2	Shaft sleeve (adjustment) [1]	EN 1.4301 (AISI 304)			[1]
75	Washer (plug)	EN 1.4301 (AISI 304)			1
76	Washer (plug)	EN 1.4301 (AISI 304)			1
77	O-ring	EPDM	9.19x2.62		1
78	O-ring	EPDM	9.19x2.62		1
90	Terminal box cover gasket [2]	NBR	-		[1]
91	Shaft washer	EN 1.4301 (AISI 304)			1
92	Lip seal	0.45-0.65-0.75-0.9 kW 1.3-1.5-2.2 kW 2.2M-3-4 kW	- 17x32x6 20x30x4 25x40x7		1 1 1
93	Lip seal	0.45-0.65-0.75-0.9 kW 1.3-1.5-2.2 kW 2.2M-3-4 kW	- 15x30x5 17x32x7 25x40x7		1 1 1
94	Shaft sleeve (bearing)	WC - Tungsten carbide			[1]
200	Screw	EN 1.4301 (AISI 304)	M6x16	UNI 5931	8
233	Plate	EN 1.4301 (AISI 304)			4

- [1] See table pag. 303
[2] Only for single phase
[3] Only for 18-5T/4 and 18-6T/4



HORIZONTAL MULTISTAGE PUMPS

MATRIX

CONSTRUCTION

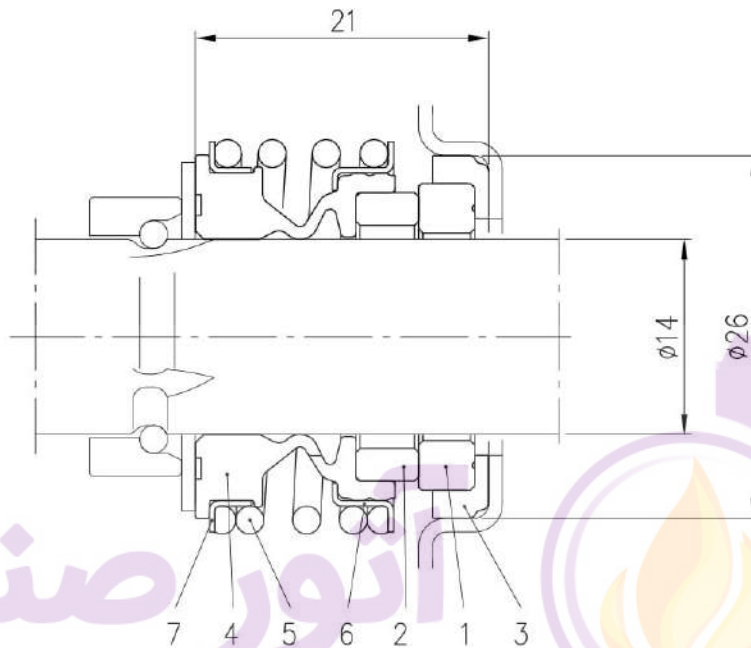
50Hz

Rev. D

QUANTITY FOR MODEL

Pump type	7	17	30-1	30-2	42	58	59	60	62	68	69-1	69-2	90	94
MATRIX 3-2T/0,45M	2	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 3-2T/0,45		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 3-3T/0,65M	3	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 3-3T/0,65		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 3-4T/0,65M	4	-	-	-	1	1	1	2	-	6	-	-	1	-
MATRIX 3-4T/0,65		1	-	-	1	-	-	2	-	6	-	-	-	-
MATRIX 3-5T/0,75M	5	-	-	-	1	1	1	3	-	8	-	-	1	-
MATRIX 3-5T/0,75		1	-	-	1	-	-	3	-	8	-	-	-	-
MATRIX 3-6T/0,9M	6	-	-	-	1	1	1	4	-	10	-	-	1	-
MATRIX 3-6T/0,9		1	-	-	1	-	-	4	-	10	-	-	-	-
MATRIX 3-7T/1,3M	7	-	-	-	1	1	1	4	1	10	1	1	1	1
MATRIX 3-7T/1,3		1	-	-	1	-	-	4	1	10	1	1	-	1
MATRIX 3-8T/1,3M	8	-	-	-	1	1	1	5	1	12	1	1	1	1
MATRIX 3-8T/1,3		1	-	-	1	-	-	5	1	12	1	1	-	1
MATRIX 3-9T/1,5M	9	-	-	-	1	1	1	6	1	14	1	1	1	1
MATRIX 3-9T/1,5		1	-	-	1	-	-	6	1	14	1	1	-	1
MATRIX 5-2T/0,45M	2	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 5-2T/0,45		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 5-3T/0,65M	3	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 5-3T/0,65		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 5-4T/0,9M	4	-	-	-	1	1	1	2	-	6	-	-	1	-
MATRIX 5-4T/0,9		1	-	-	1	-	-	2	-	6	-	-	-	-
MATRIX 5-5T/1,3M	5	-	-	-	1	1	1	3	-	8	-	-	1	-
MATRIX 5-5T/1,3		1	-	-	1	-	-	3	-	8	-	-	-	-
MATRIX 5-6T/1,3M	6	-	-	-	1	1	1	4	-	10	-	-	1	-
MATRIX 5-6T/1,3		1	-	-	1	-	-	4	-	10	-	-	-	-
MATRIX 5-7T/1,5M	7	-	-	-	1	1	1	4	1	10	1	1	1	1
MATRIX 5-7T/1,5		1	-	-	1	-	-	4	1	10	1	1	-	1
MATRIX 5-8T/2,2M	8	-	-	-	-	1	1	5	1	12	1	1	1	1
MATRIX 5-8T/2,2		1	-	-	1	-	-	5	1	12	1	1	-	1
MATRIX 5-9T/2,2M	9	-	-	-	-	1	1	6	1	14	1	1	1	1
MATRIX 5-9T/2,2		1	-	-	1	-	-	6	1	14	1	1	-	1
MATRIX 10-2T/0,75M	2	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 10-2T/0,75		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 10-3T/1,3M	3	-	-	-	1	1	1	1	-	4	-	-	1	-
MATRIX 10-3T/1,3		1	-	-	1	-	-	1	-	4	-	-	-	-
MATRIX 10-4T/1,5M	4	-	-	-	1	1	1	2	-	6	-	-	1	-
MATRIX 10-4T/1,5		1	-	-	1	-	-	2	-	6	-	-	-	-
MATRIX 10-5T/2,2M	5	-	-	-	-	1	1	3	-	8	-	-	1	-
MATRIX 10-5T/2,2		1	-	-	1	-	-	3	-	8	-	-	-	-
MATRIX 10-6T/2,2M	6	-	-	-	-	1	1	3	1	8	1	1	1	1
MATRIX 10-6T/2,2		1	-	-	1	-	-	3	1	8	1	1	-	1
MATRIX 18-2T/1,5M	2	-	1	1	1	1	1	1	-	2	-	-	1	-
MATRIX 18-2T/1,5		1	1	1	1	-	-	1	-	2	-	-	-	-
MATRIX 18-3T/2,2M	3	-	-	1	-	1	1	1	-	2	-	-	1	-
MATRIX 18-3T/2,2		1	-	1	1	-	-	1	-	2	-	-	-	-
MATRIX 18-4T/3	4	1	-	1	-	-	-	2	-	3	-	-	-	-
MATRIX 18-5T/4	5	1	-	1	-	-	-	2	1	3	1	1	-	1
MATRIX 18-6T/4	6	1	-	1	-	-	-	3	1	4	1	1	-	1

MECHANICAL SEAL
STANDARD



Version	Material						
	1 Stationary seal ring	2 Rotary seal ring	3 Gasket	4 Bellows	5 Spring	6 Frame	7 Retainer ring
Standard	Ceramic	Carbon	EPDM	EPDM	EN 1.4402 (AISI 316)	EN 1.4402 (AISI 316)	EN 1.4402 (AISI 316)

*Approval for drinking water application

WRAS Approval product
DM174/2004

