EBARA

Technical Data

3M4

4 Pole Models
1450 RPM

Stainless Steel End Suction Pumps

(DIN 24255)

Monobloc Design
304 Stainless Steel

CONTENTS

4 POLE 50 Hz

V14

SPECIFICATIONS - FEATURES & APPLICATIONS

V14

These series of stainless steel pumps feature a unique one piece volute casing that are produced using an advanced computer controlled plasma stamping system that ensures total quality control during manufacture. With the smooth surfaces of stamped stainless steel, this results in consistent high standard products, of superior quality and high efficiency.

Features

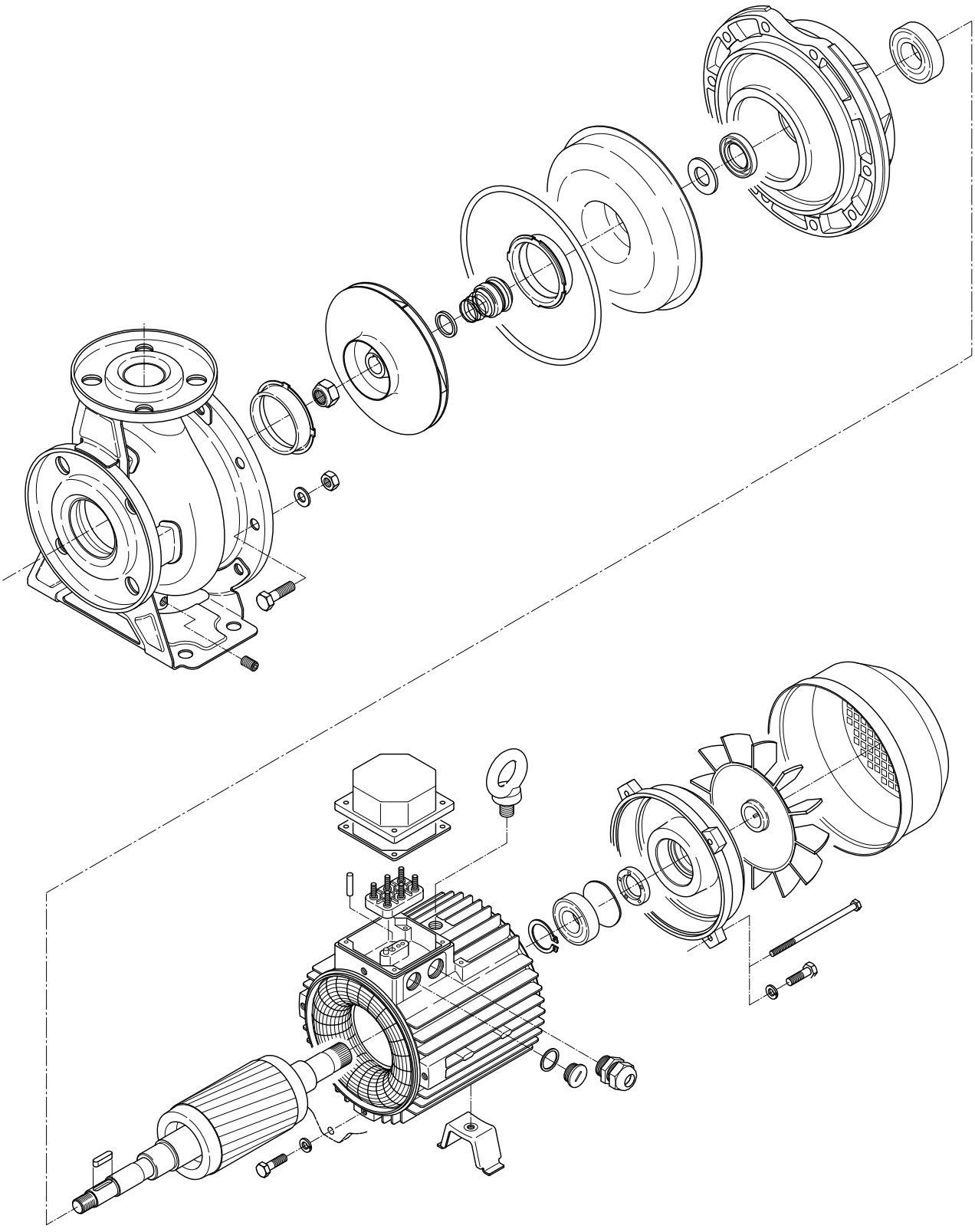
- Stainless steel liquid end components
  - High quality; corrosion resistance.
  - Manufactured in Stamped 304 Stainless Steel.
- Economical extended motor shaft design.
- High quality mechanical shaft seals and o-rings
  - Fitted standard with Carbon/Carbon/NBR mechanical seal.
- Close coupled design
  - Saves space; simplifies maintenance and installation.
- Back pullout construction
  - Assembly and overhaul of the impeller and seal without disturbing suction and discharge connections.
- High operating efficiency
  - Lowers operating costs.
- Top centerline discharge and foot support under casing
  - Ensures self-venting and reduces misalignment from pipe loads.

Applications

- Plant services
- Water supply systems
- Washing plants
- Cooling water
- Air conditioning
- Sprinkler/flow irrigation
- OEM equipment application
- Pressure boosting
- Liquid transfer
- Heat exchanger
- Spray systems
- Heating
- Water reclamation and treatment

SPECIFICATIONS -TYPICAL CROSS SECTIONAL VIEW

V14



PUMP SPECIFICATIONS

4 POLE 50 Hz

V14

Liquid Handled	Type of liquid				Clean water and moderately aggressive fluids
	Temperature	min.		[°C]	-10
		max.			+90 110 for High temp and hard face seal (Optional)
Maximum working pressure				[MPa]	1
Construction	Impeller				Closed centrifugal type for [32, 40, 50 version] Reinforced laser welding for [40-200/1.5, 50-200/2.2]
	Shaft seal type				Mechanical seal
	Bearing				Bearing with contact seal
Pipe Connection	Suction	32-160/200			Flange DN50 according DIN 2532 standard
		40-125/160/200			Flange DN65 according DIN 2532 standard
		50-125/160/200			Flange DN65 according DIN 2532 standard
	Discharge	32-160/200			Flange DN32 according DIN 2532 standard
		40-125/160/200			Flange DN40 according DIN 2532 standard
		50-125/160/200			Flange DN50 according DIN 2532 standard
Material	Casing				EN 1.4301 (AISI 304)
	Impeller				EN 1.4301 (AISI 304)
	Casing cover				EN 1.4301 (AISI 304)
	Mechanical seal				**Ceramic/Carbon/NBR** [standard version] **Ceramic/Carbon/FPM** [H option] High Temp seal **SiC/SiC/FPM** [HS option] Hard Face Seal
	O-ring				NBR FPM for [H-HS option]
	Shaft	32, 40, 50	d=19		EN 1.4301 (AISI 304)
		50-200/2.2	d=22		
	Bracket				Cast iron - aluminium

Type Key

3M4 40 -160 / 0.55

- 4= 4 Pole
- Discharge
- Impeller Code
- Kw

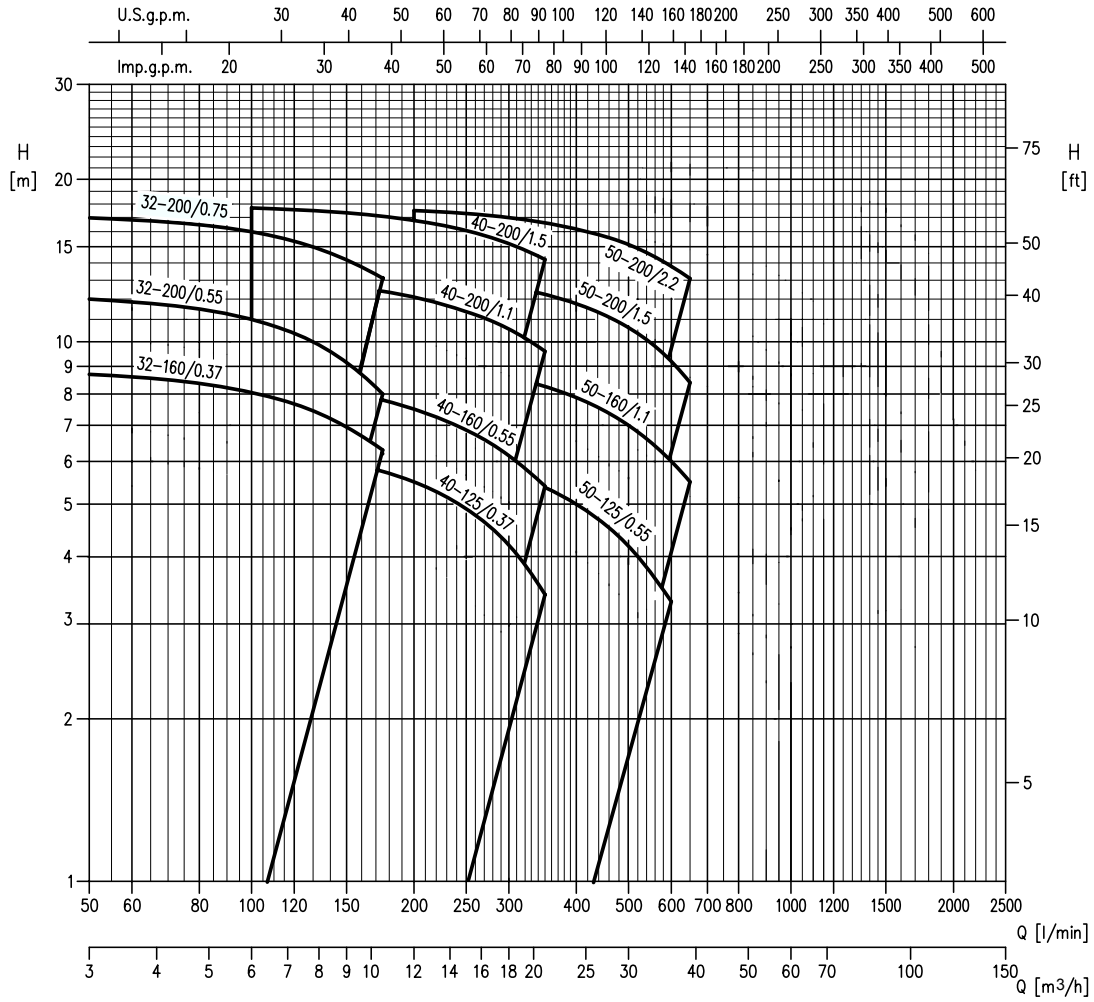
MOTOR SPECIFICATIONS

Type		Electric-TEFC
		Three phase
No.of Poles		4
Rotation speed	(min -1)	~1400
Insulation class		F (class B for temperature rise)
Protection degree		IP 55
Power rating	[kW]	0.37 ÷ 2.2
	[HP]	0.5 ÷ 3.0
Frequency	[HZ]	50
Voltage	[V]	230/400 ±10%
Casing material		Aluminium
Efficiency Level		- from 0.37 kW up to 0.55 kW IE2 from 0.75 kW ip to 7.5 kW

SELECTION CHART

4 POLE 50 Hz

V14



Pump type	kW	HP	Q=Capacity l/min 0	50	100	150	175	200	250	300	350	400	500	600	650
				3	6	9	10,5	12	15	18	21	24	30	36	39
			H=Total manometric head in meters												
32-160/0.37	0.37	0.5	9	8.7	8.1	7	6.3	-	-	-	-	-	-	-	-
32-200/0.55	0.55	0.75	12.5	12	11	9.2	8	-	-	-	-	-	-	-	-
32-200/0.75	0.75	1	17.5	17.1	16.1	14.3	13.2	-	-	-	-	-	-	-	-
40-125/0.37	0.37	0.5	6.5	-	6.3	6	5.8	5.5	4.9	4.2	3.4	-	-	-	-
40-160/0.55	0.55	0.75	9.1	-	8.6	8.1	7.8	7.5	6.9	6.2	5.4	-	-	-	-
40-200/1.1	1.1	1.5	13.6	-	13.2	12.7	12.4	12.1	11.4	10.6	9.6	-	-	-	-
40-200/1.5	1.5	2	18	-	17.7	17.3	17.1	16.8	16.1	15.2	14.2	-	-	-	-
50-125/0.55	0.55	0.75	6.4	-	-	-	-	6.2	6	5.7	5.4	5	4.2	3.3	-
50-160/1.1	1.1	1.5	9.5	-	-	-	-	9.1	8.9	8.6	8.3	7.9	7	6	5.5
50-200/1.5	1.5	2	14	-	-	-	-	13.3	13	12.7	12.2	11.8	10.6	9.2	8.4
50-200/2.2	2.2	3	17.8	-	-	-	-	17.5	17.3	17	16.6	16.2	15.1	13.8	13.1

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 and with a kinematic viscosity of $\nu = 1\ mm^2/s$ (1 cSt)
- The NPSH curve is an average curve obtained in the same conditions of performance curves. During the pump selection, consider to get a safety margin of at least 1 m.
- The continuos 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 P_2 = pump power input (shaft power)
  H = total head η = pump efficiency
  NPSH = net positive suction head required by the pump

SELECTION CHART

4 POLE 50 Hz

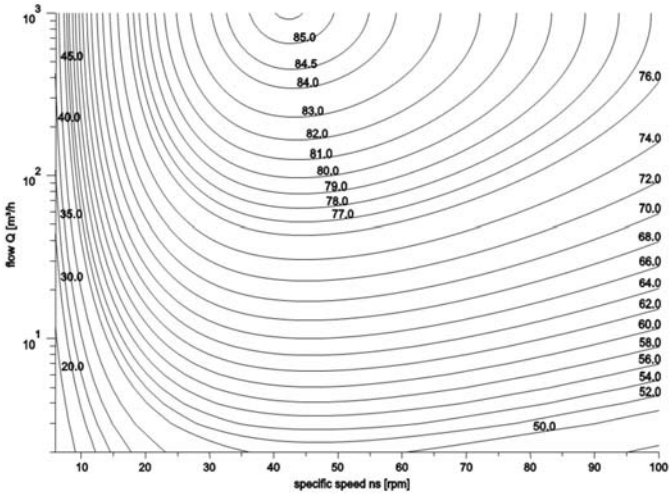
V14

The minimun 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.

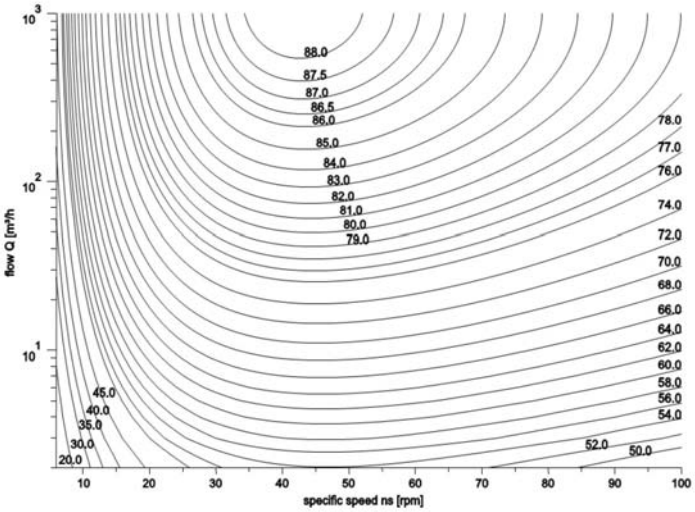
The efficiency of a pump with trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point,leading to a reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.

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

MEI = 0.4 for ESOB 1450



MEI = 0.7 for ESOB 1450 rpm

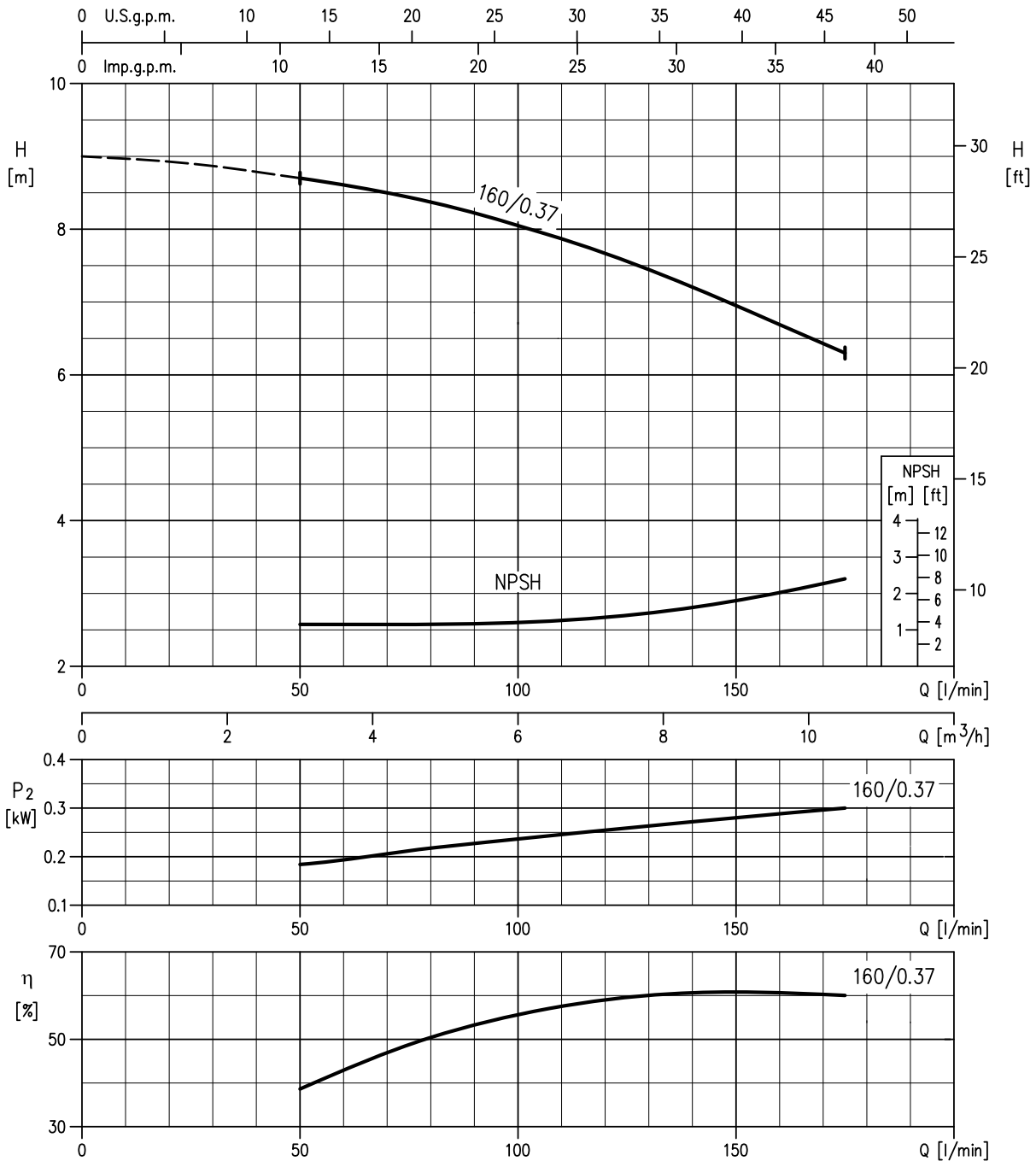


PERFORMANCE CURVE

4 POLE 50 Hz

V14

32-160/0.37 (0.37kW) MEI > 0.70 – impeller diameter = 166 mm



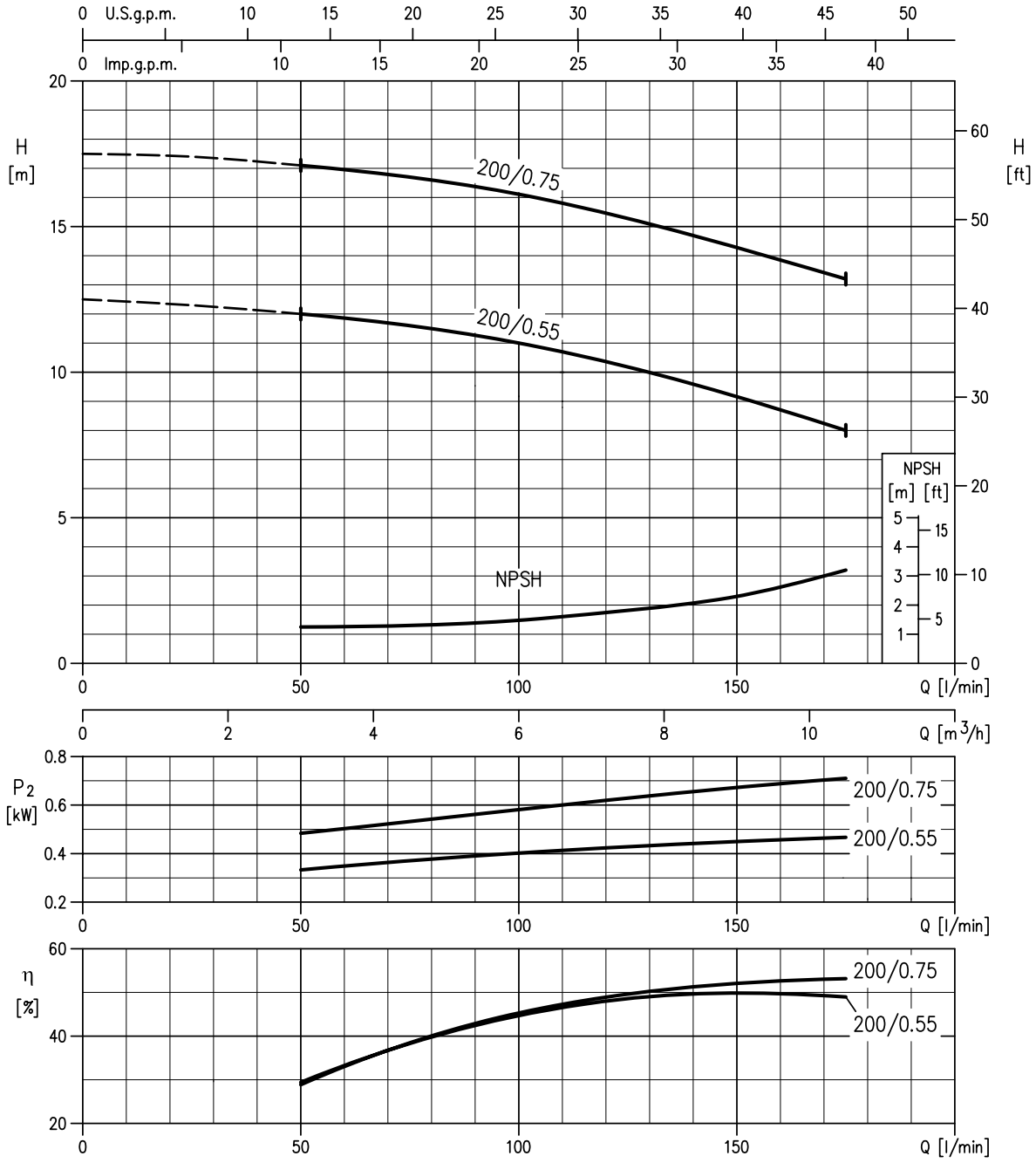
Rotation speed ≈ 1400 min^{-1}
Test standard: ISO 9906 – Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

32-200/0.55 (0.55kW) MEI > 0.70 – impeller diameter = 200 mm
32-200/0.75 (0.55kW) MEI > 0.70 – impeller diameter = 224 mm



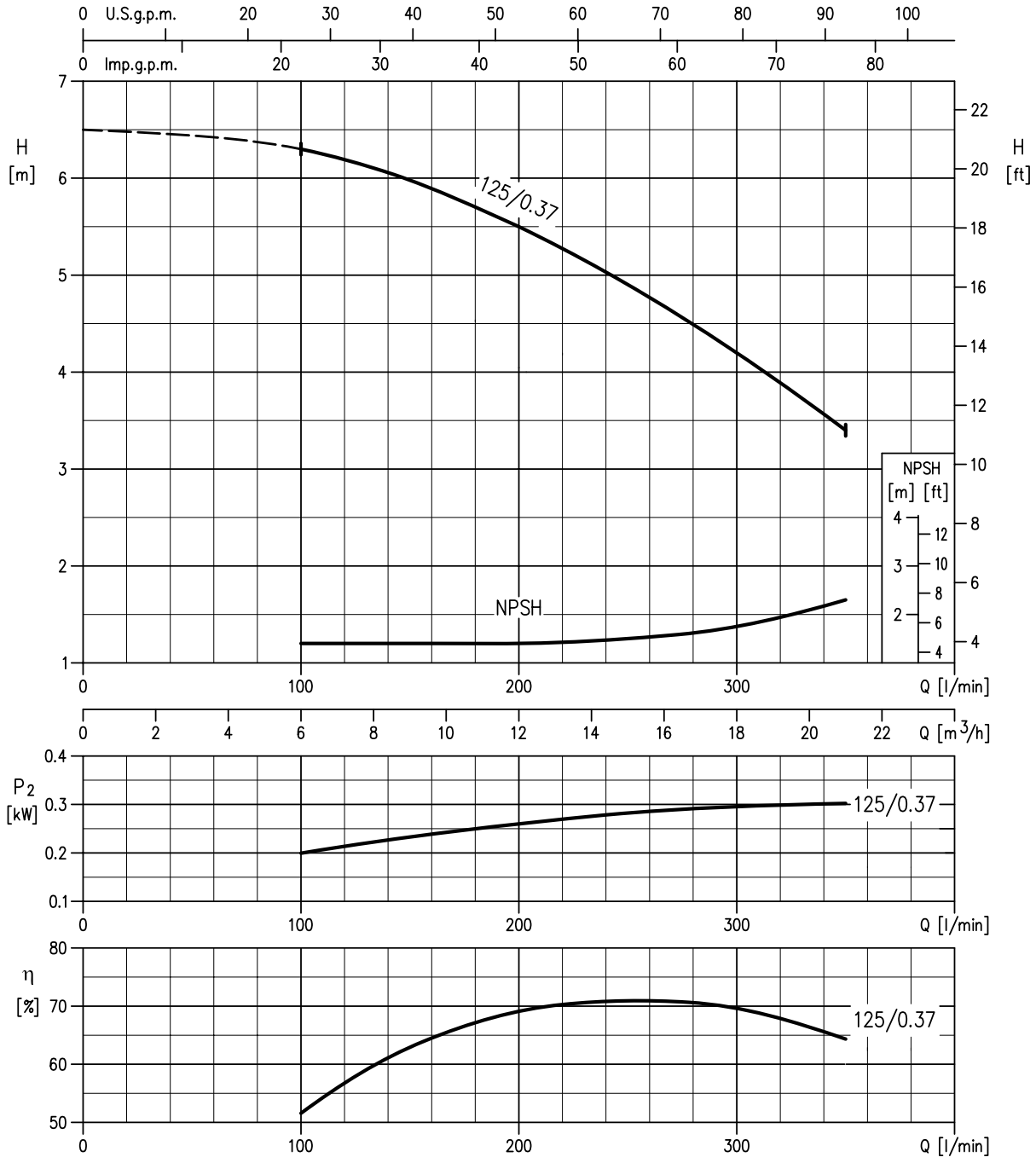
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

40-125/0.37 (0.37 kW) MEI > 0.70 – impeller diameter = 140 mm



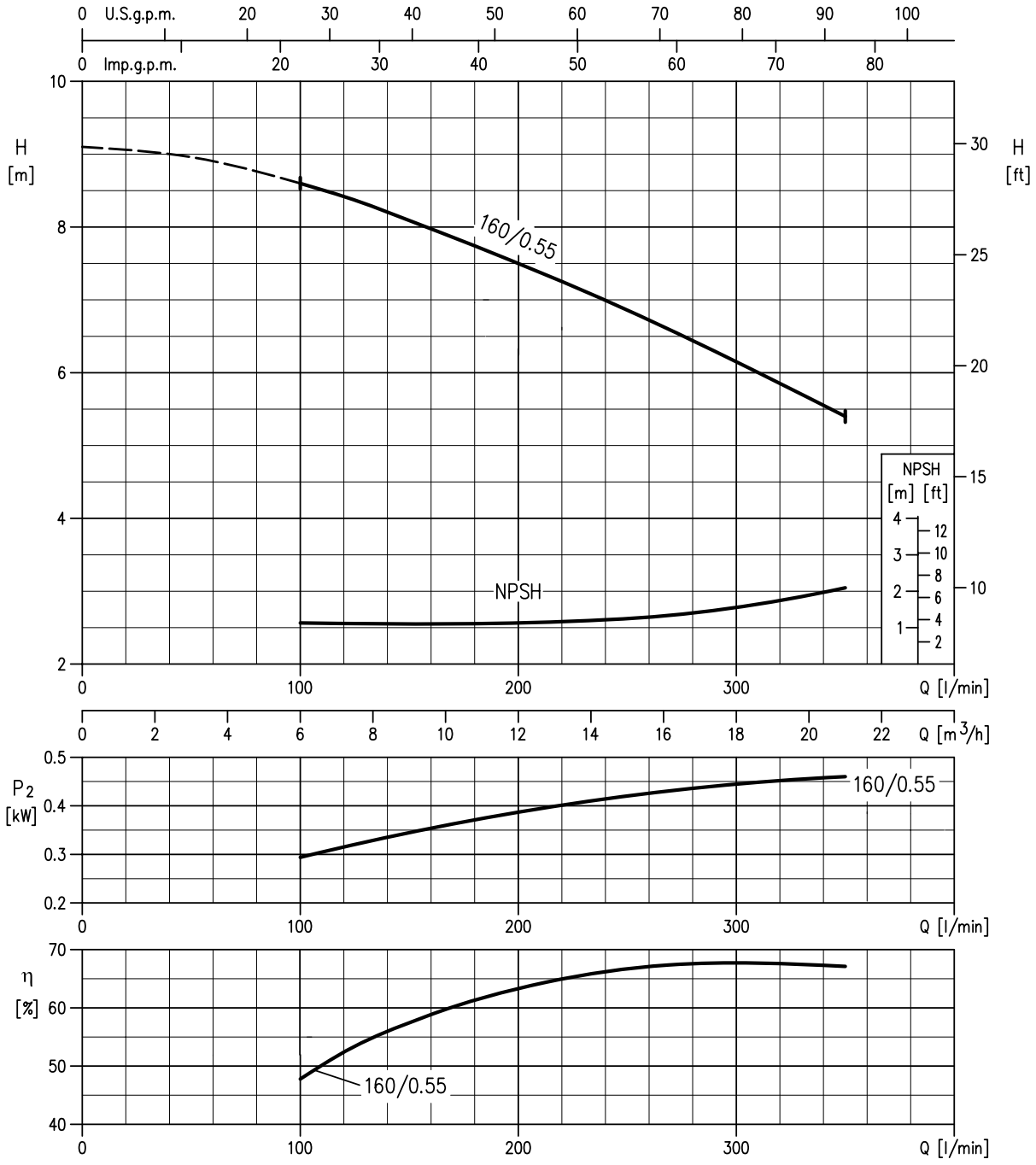
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

40-160/0.55 (0.55 kW) MEI > 0.40 – impeller diameter = 166 mm



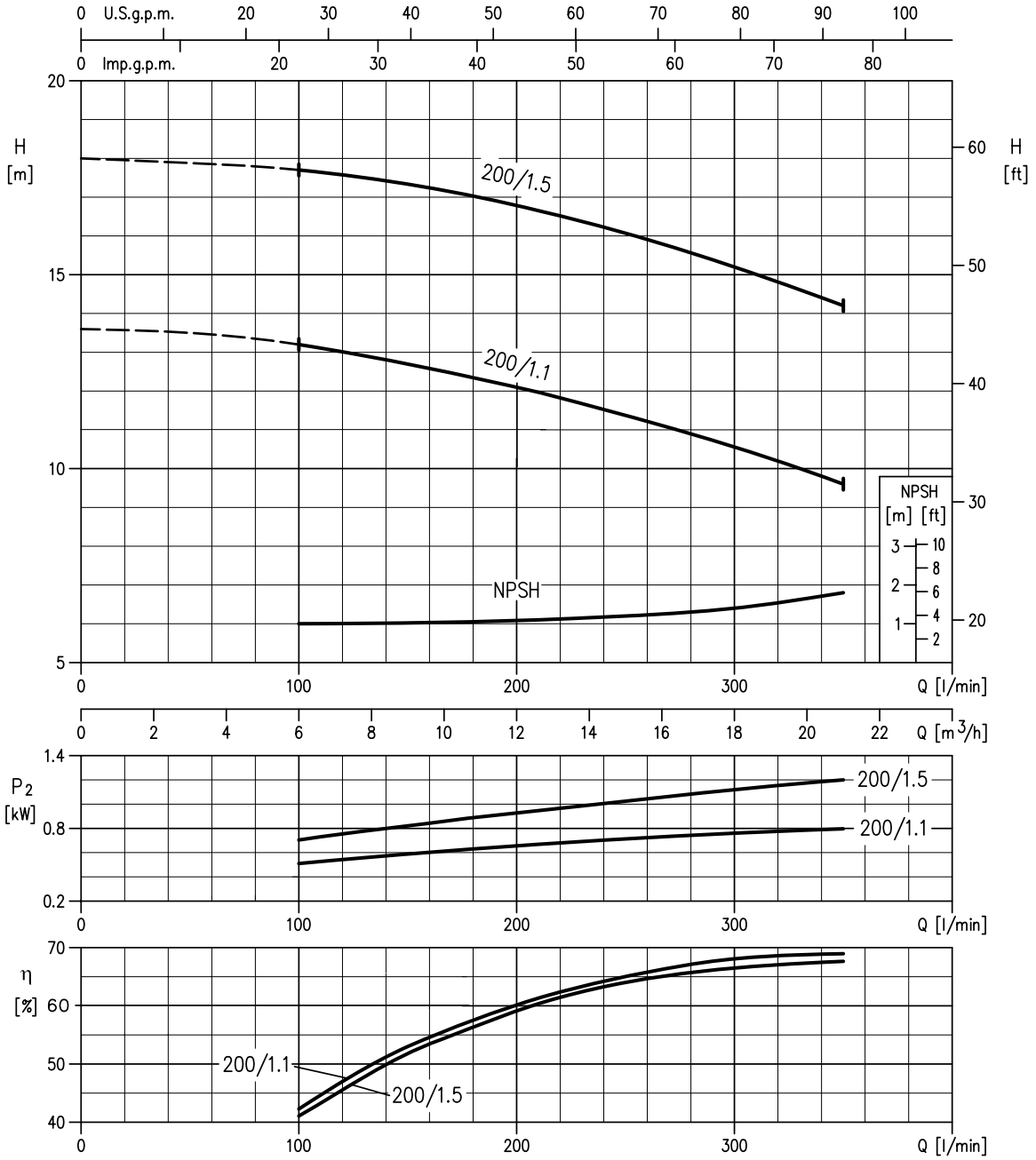
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

40-200/1.1 (1.1 kW) MEI > 0.70 – impeller diameter = 200 mm
40-200/1.5 (1.5 kW) MEI > 0.70 – impeller diameter = 224 mm



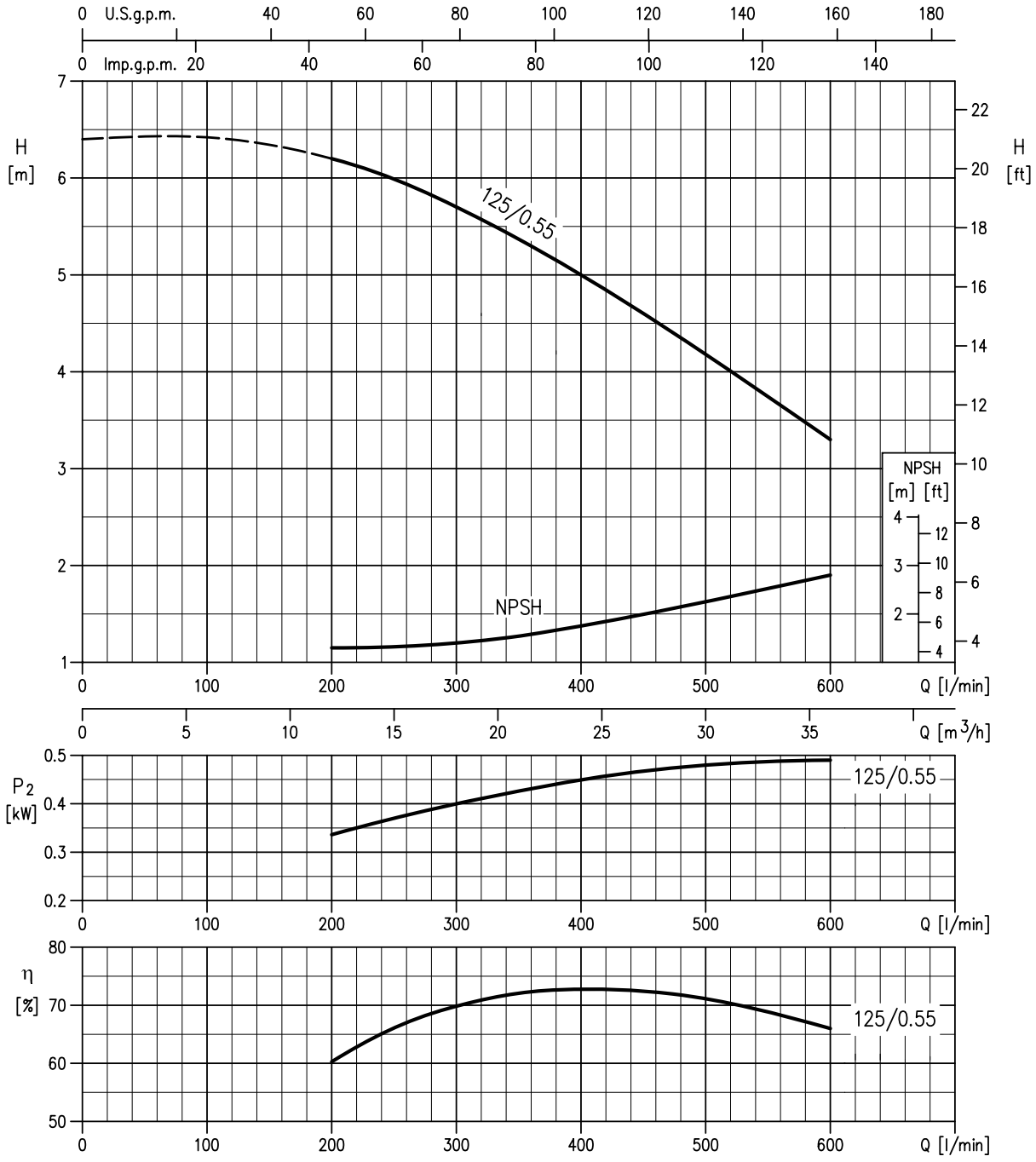
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

50-125/0.55 (0.55 kW) MEI > 0.40 – impeller diameter = 140 mm



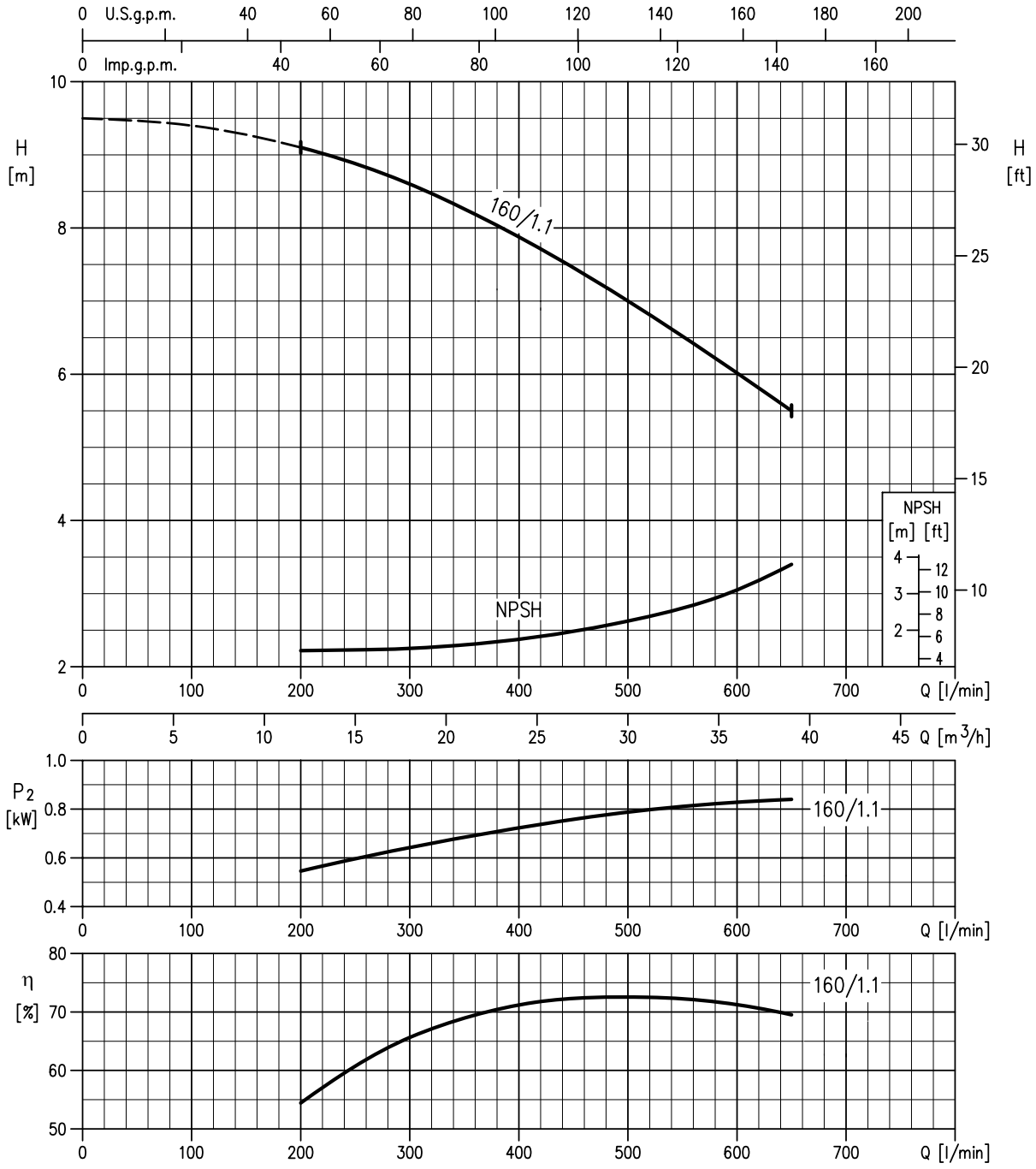
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

50-160/1.1 (1.1 kW) MEI > 0.30 – impeller diameter = 166 mm



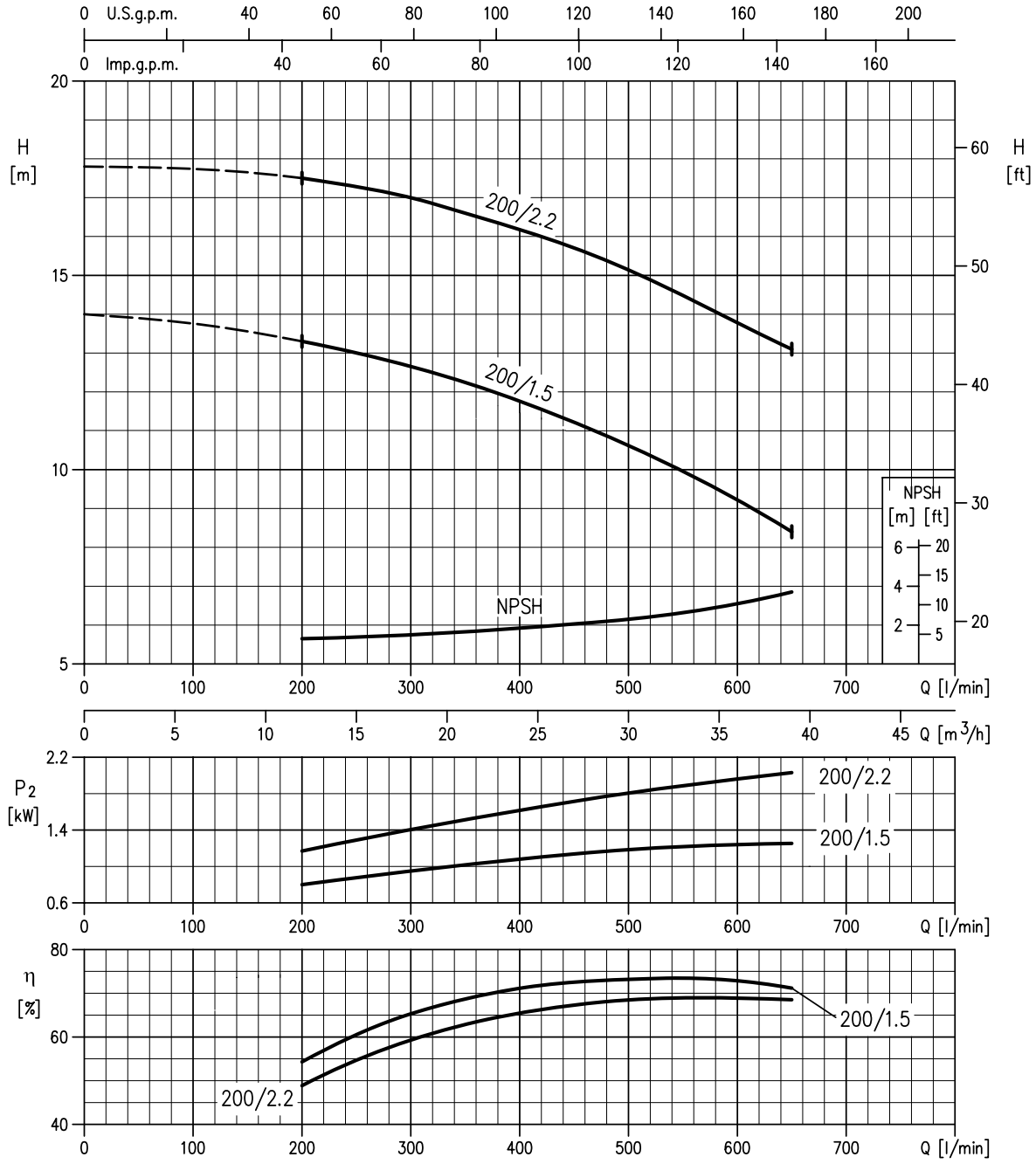
Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

PERFORMANCE CURVE

4 POLE 50 Hz

V14

50-200/1.5 (1.5 kW) MEI > 0.60 – impeller diameter = 200 mm
50-200/2.2 (2.2 kW) MEI > 0.60 – impeller diameter = 224 mm

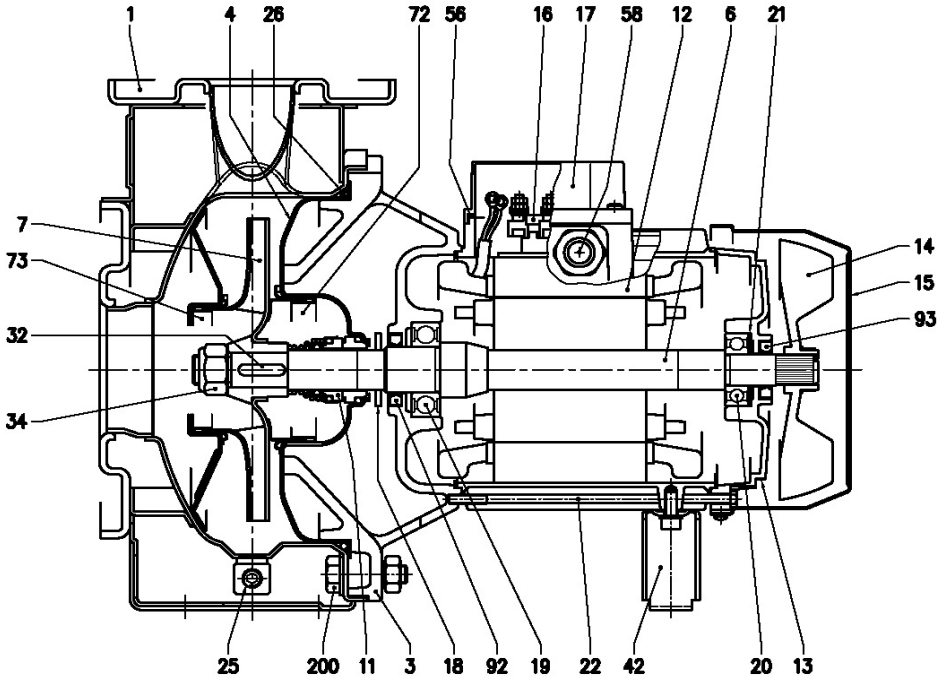


Rotation speed ≈1400 min-1
Test standard : ISO 9906 Annex A

CONSTRUCTIONS - SECTIONAL VIEW

4 POLE 50 Hz

V14



N°	PART NAME		MATERIAL 3M4	DIMENSIONS	STANDARD	N. FOR 1 UNIT
001	Casing		EN 1.4301 (AISI 304)			1
003	Motor bracket		Cast iron EN-GJL-200-EN 1561			1
004	Casing cover		EN 1.4301 (AISI 304)			1
006	Shaft with rotor-Part in contact with liquid		EN 1.4301 (AISI 304)			1
007	Impeller		EN 1.4301 (AISI 304)			1
011	Mechanical seal		Carbon/Ceramic/NBR Carbon/Ceramic/FPM (H option) SiC/SiC/FPM (HS option)	See p. 301		1
012	Motor frame with stator		-			1
013	Motor cover		Aluminium			1
014	Fan		Polyamide			1
015	Fan cover		Fe P04 Zinc-coated			1
016	Terminal		-			1
017	Terminal box cover		Aluminium (three phase version)			1
018	Splash ring		NBR	40x21.5x3	EBARA DRAWING	1
019	Bearing		-	See table p.500		1
020	Bearing		-	See table p.500		1
021	Adjusting ring		Steel C70			1
022	Tie rod		Fe 42 Zinc-coated	M5	EBARA DRAWING	4
025	Drain plug		EN 1.4401 (AISI 316) / PTFE	R 1/8" L=8	DIN 906	1
026	"O" ring	40-125	NBR FPM (H-HS option)	158.11x5.34	OR 6625	1
		32-160, 40-160, 50-125		183.52x5.34	OR 6720	
		32-200, 40-200,50-160, 50-200		227.96x5.34	OR 6895	
032	Key		EN 1.4401 (AISI 316)	6x6x25	UNI 6604	1
034	Impeller nut	Other models	EN 1.4301 (AISI 304)	M16x1.5	UNI 7474	1
		50-200/2.2		M18x1.5		
042	Foot		Aluminium / Zinc-coated steel		EBARA DRAWING	1
056	Box gasket		NBR			1
058	Fastening nut		-			1
072	Casing ring [1]		EN 1.4301 (AISI 304)			1
073	Casing ring		EN 1.4301 (AISI 304)			1
092	Lip seal	Up to 1.5kW	-	25x40x7	DIN 3760 without spring	1
		From 2.2kW to 3kW		30x47X7		
093	Lip seal	For 0.37kW and 0.55kW	-	17x32X7	DIN 3760 without spring	1
		From 0.75 kW to 3kW		25x40x7		
200	Screw	40-125	Stainless steel A2 70 class ISO 3506/1	M 8x30	UNI 5739	8
		40-160, 40-200, 50-125, 50-160, 50-200		M 10x35	UNI 5739	[2]

Counterflange kit on request, see table p. 328-329 [1] For version 32-200, 40-200, 50-160 , 50-200 [2] N° for 1 unit=10 for 32-160, 40-160, 50-125
N° for 1 unit=12 for 32-200, 40-200, 50-160, 50-200

CONSTRUCTIONS - MECHANICAL SEAL

4 POLE 50 Hz

V14

FIG. 1

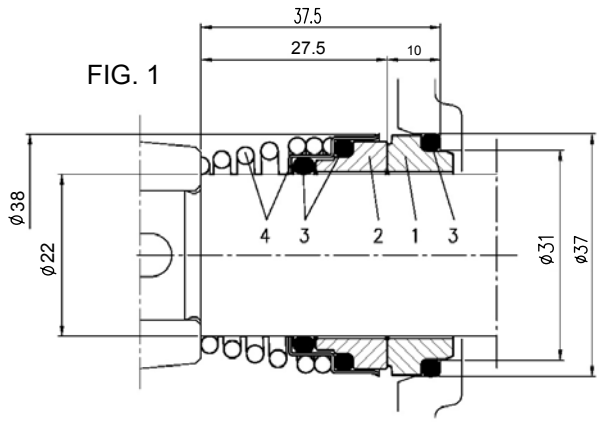


FIG. 2

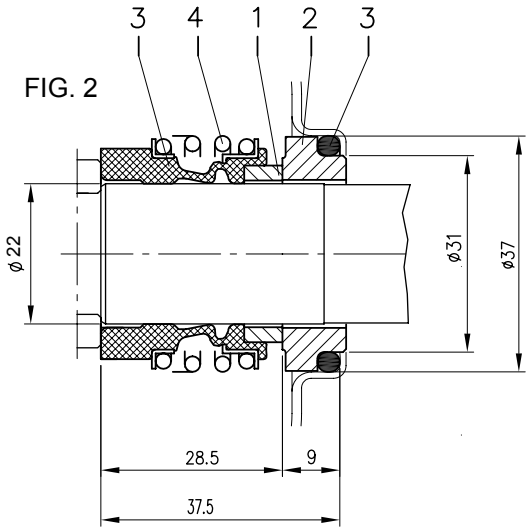


Figure	Ebara Reference (Version)	Manufacturer Reference			Material 1	2	3	4
		Manuf.	Description	Material Description	Stationary seal ring	Rotary seal ring	rubber	Frame + spring
Fig. 1	Standard	Roten	UNITEN 3K	X6X62V6	Carbon	Ceramic	NBR	EN 1.4401 (AISI 316)
Fig. 1	High temp*			XYXY2VY	Carbon	Ceramic	FPM	EN 1.4401 (AISI 316)
Fig. 2	Hard Face*	Burgmann	MG1S6/22-G3	Q1Q1VGG	SiC	SiC	FPM	EN 1.4571 (AISI 316Ti)

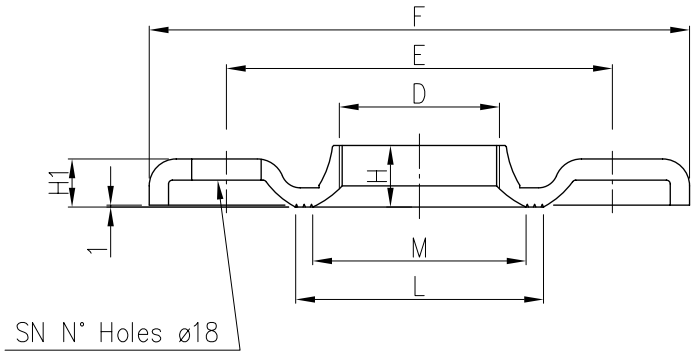
* High temp and Hard face seal options can be fitted to pump or available as a spare part

CONSTRUCTIONS - COMPANION FLANGE

4 POLE 50 Hz

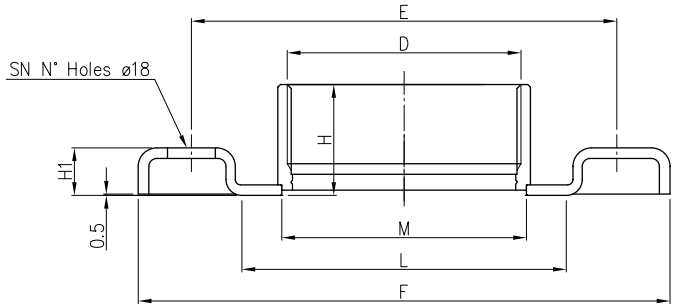
V14

ZINCED STEEL



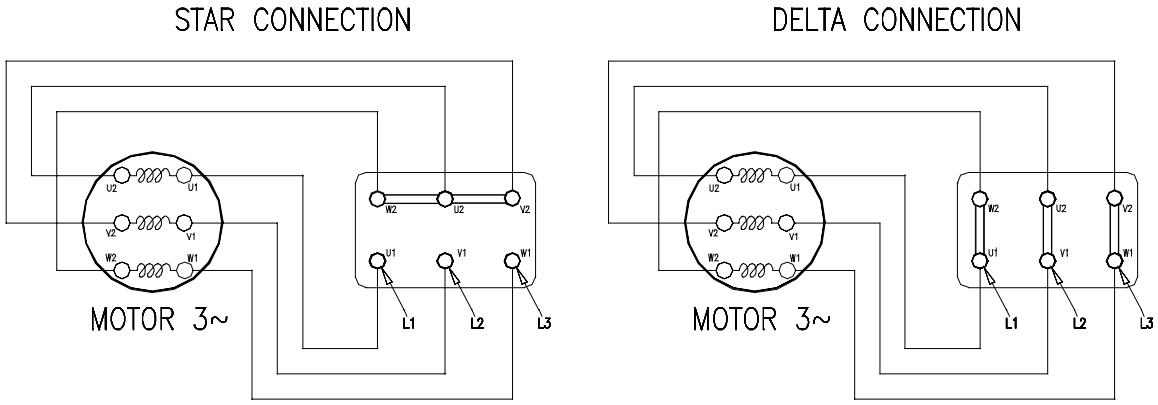
Counterflange									Screw	
DN	D	E	F	H	H1	L	M	SN	DIMENSIONS	MATERIAL
32	G 1 1/4	100	100	15	11.5	67	50	4	M16x55	Zn. Steel 8.8 strenght class ISO 898-1
40	G 1 1/2	110	110	17.5	11.5	72	58	4		
50	G2	125	125	19	15	89	70	4		
65	G 2 1/2	145	185	23	14	104	88	4		

EN 1.4301 (AISI 304)



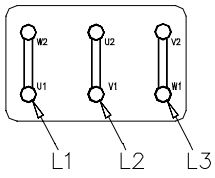
Counterflange									Screw	
DN	D	E	F	H	H1	L	M	SN	DIMENSIONS	MATERIAL
32	G 1 1/4	100	140	29.5	14	66	44	4	M16x55	A2-70 class ISO 3506-1
40	G 1 1/2	110	150	29.5	14	71	50.5			
50	G 2	125	165	34	16	83	63			
65	G 2 1/2	145	185	40	16	103	80			

THREE PHASE

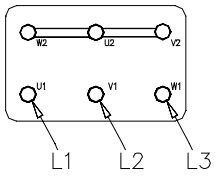


FOR MOTOR 4 kW AND BELOW

DELTA CONNECTION 230 V



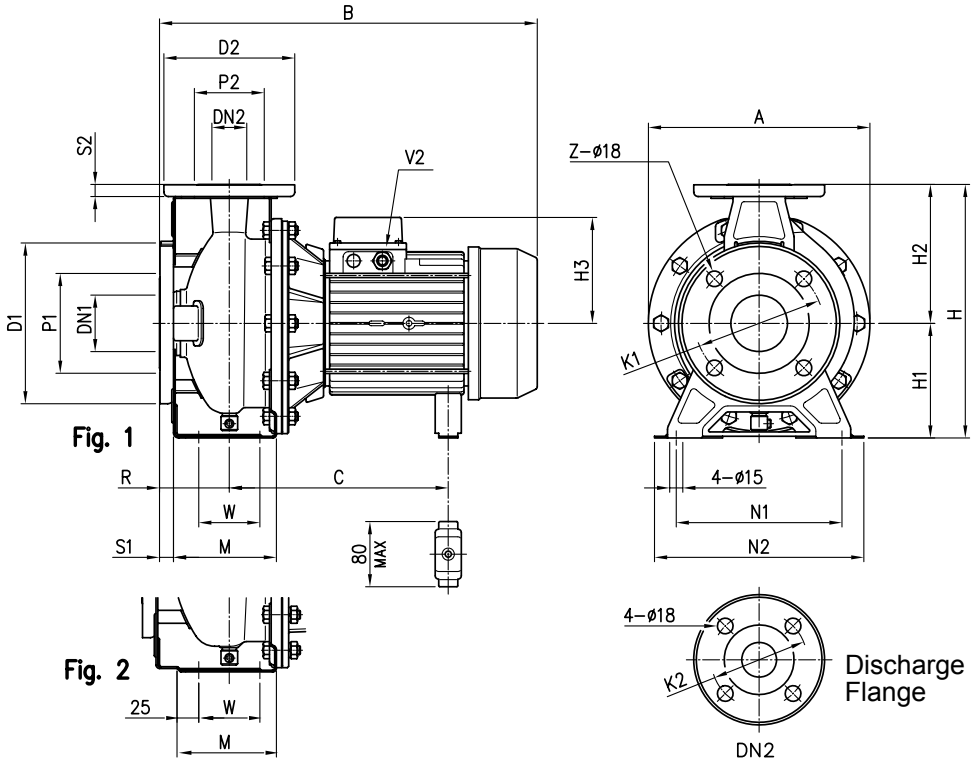
STAR CONNECTION 400 V



DIMENSIONS

4 POLE 50 Hz

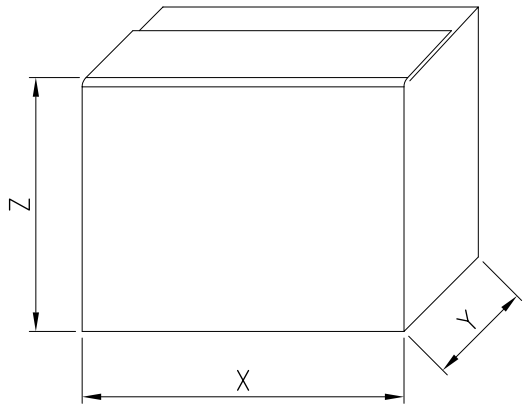
V14



Model	Dimensions (mm)																									Weight
	Ø DN1	Ø P1	Ø K1	Ø D1	S1	Z	Ø DN2	Ø P2	Ø K2	Ø D2	S2	Fig.	H	H1	H2	H3	R	W	M	N1	N2	A	B	C	V2	[kgf]
32-160/0.37	50	95	125	165	16	4	32	75	100	140	14	1	292	132	160	119	80	70	118	190	240	254	395	219	PG 11	20
32-200/0.55	50	95	125	165	16	4	32	75	100	140	14	1	340	160	180	119	80	70	119	190	240	296	395	219	PG 11	24.5
32-200/0.75	50	95	125	165	16	4	32	75	100	140	14	1	340	160	180	124	80	70	119	190	240	296	408	219÷230	PG 13.5	28
40-125/0.37	65	115	145	185	16	4	40	80	110	150	14	1	252	112	140	102	80	70	114	160	210	213	371	205	PG 11	15.5
40-160/0.55	65	115	145	185	16	4	40	80	110	150	14	1	292	132	160	119	80	70	118	190	240	254	395	219	PG 11	20.5
40-200/1.1	65	115	145	185	16	4	40	80	110	150	14	2	340	160	180	124	100	70	115	212	265	296	428	219÷230	PG 13.5	28.5
40-200/1.5	65	115	145	185	16	4	40	80	110	150	14	2	340	160	180	124	100	70	115	212	265	296	428	219÷230	PG 13.5	30.5
50-125/0.55	65	115	145	185	16	4	50	95	125	165	16	2	292	132	160	119	100	70	114	190	240	254	415	219	PG 11	20.5
50-160/1.1	65	115	145	185	16	4	50	95	125	165	16	2	340	160	180	124	100	70	115	212	265	296	428	219÷230	PG 13.5	25.5
50-200/1.5	65	115	145	185	16	4	50	95	125	165	16	2	360	160	200	124	100	70	115	212	265	296	428	219÷230	PG 13.5	31.5
50-200/2.2	65	115	145	185	16	4	50	95	125	165	16	2	360	160	200	141	100	70	115	212	265	296	474	253	PG 16	36

PACKING AND WEIGHT

Pump Type	PACKING [mm] X	Y	Z	WEIGHT [Kg]
32-160/0.37	430	280	330	21.5
32-200/0.55	490	330	390	26.5
32-200/0.75				31
40-125/0.37	440	250	300	17
40-160/0.55	430	280	330	23
40-200/1.1	490	330	390	31.5
40-200/1.5				33
50-125/0.55	430	280	330	22.5
50-160/1.1	490	330	390	31.5
50-200/1.5				32.5
50-200/2.2				38.5



MOTOR & BEARING DATA

4 POLE 50 Hz

V14

Pump type	Power		Efficiency	Input [kW]	Efficiency (% load) and power-factor				Full load current [A]			Locked rotor current [A]		
					η %			cos–ϕ						
	[kW]	[HP]			50%	75%	100%		230 V	400 V	690 V	230 V	400 V	690 V
3M4 32-160/0.37	0.37	0.5	-	0.80	-	-	-	-	2.6	1.5	-	9.9	5.7	-
3M4 32-200/0.55	0.55	0.75	-	0.80	-	-	-	-	2.6	1.5	-	9.9	5.7	-
3M4 32-200/0.75	0.75	1	IE2	1.41	78.4	81.6	81.9	0.76	4.6	2.7	-	32.0	18.5	-
3M4 40-125/0.37	0.37	0.5	-	0.55	-	-	-	-	1.9	1.1	-	7.3	4.2	-
3M4 40-160/0.55	0.55	0.75	-	0.80	-	-	-	-	2.6	1.5	-	9.9	5.7	-
3M4 40-200/1.1	1.1	1.5	IE2	1.41	78.4	81.6	81.9	0.76	4.6	2.7	-	32.0	18.5	-
3M4 40-200/1.5	1.5	2	IE2	1.88	80.3	83.4	83.8	0.75	6.2	3.6	-	45.0	26.0	-
3M 50-125/0.55	0.55	0.75	-	0.80	-	-	-	-	2.6	1.5	-	9.9	5.7	-
3M4 50-160/1.1	1.1	1.5	IE2	1.41	78.4	81.6	81.9	0.76	4.6	2.7	-	32.0	18.5	-
3M4 50-200/1.5	1.5	2	IE2	1.88	80.3	83.4	83.8	0.75	6.2	3.6	-	45.0	26.0	-
3M4 50-200/2.2	2.2	3	IE2	2.70	84.6	86.0	85.6	0.83	8.1	4.7	-	52.0	30.0	-

Pump type	Bearing size	
	Pump side	Fan side
3M4 32-160/0.37	6205-2RSH C3	6203-2RSH
3M4 32-200/0.55		
3M4 32-200/0.75		6205-2RSH C3
3M4 40-125/0.37	6205-2RSH C3	6202-2RSH
3M4 40-160/0.55		6203-2RSH
3M4 40-200/1.1		6205-2RSH C3
3M4 40-200/1.5		
3M4 50-125/0.55	6205-2RSH C3	6203-2RSH
3M4 50-160/1.1		6205-2RSH C3
3M4 50-200/1.5		
3M4 50-200/2.2		