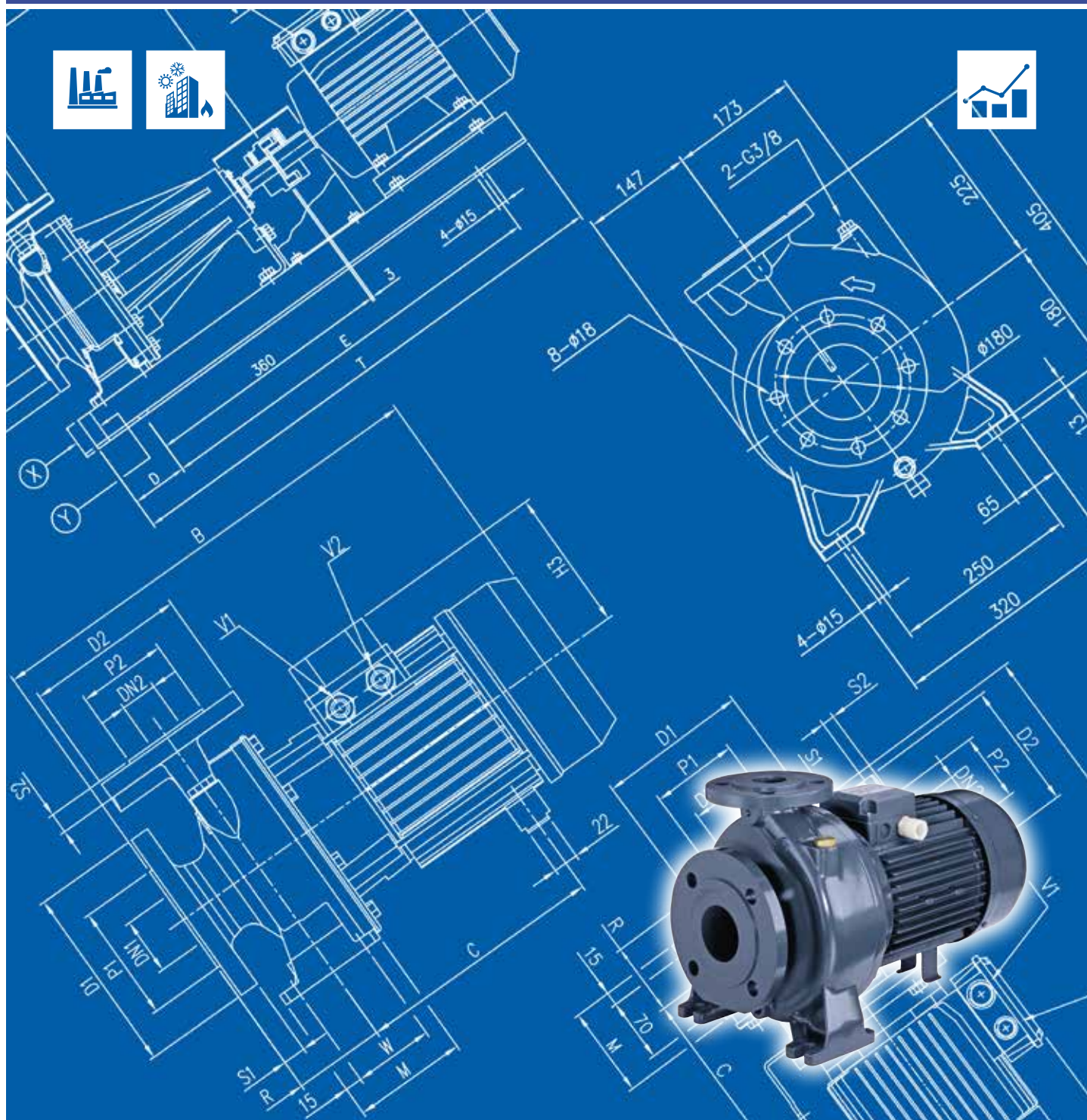




Japanese Technology since 1912

MD

Data Book 60Hz



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① click INDEX to jump CORRESPONDING SECTION

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SPECIFICATIONS

60Hz

Rev. K

PUMP		
Liquid Handled	Type of liquid	Clean water and moderately aggressive fluids
	Temperature [°C]	min. -5 max. +90 (STANDARD-E) max. +110 (H-HS-HSW-HW)
Maximum working pressure [MPa]		1
Flange		UNI 2236
Counterflange (On request)		UNI 2247
Construction	Impeller	Closed centrifugal type
	Shaft seal type	Mechanical seal
	Bearing	Sealed ball bearing
Pipe Connection	Suction	Flange to DIN 2532 (50 mm - 65 mm)
	Discharge	Flange to DIN 2532 (32 mm - 40 mm - 50 mm)
Material	Casing	Cast iron
	Impeller	AISI 304
	Shaft seal	Ceramic/Carbon/NBR (for MD) Ceramic/Carbon/FPM (for MDH) SiC/SiC/FPM (for MDHS) Tungsten Carbide/Tungsten Carbide/FPM (for MDHSW) Tungsten Carbide/Tungsten Carbide/FPM (for MDHW) Carbon/Ceramic/EPDM VBEGF (for MDE)
Shaft	AISI 304 (wet extension)	
Bracket	Cast iron	
Applicable standard of test		ISO 9906:2012 - Grade 3B

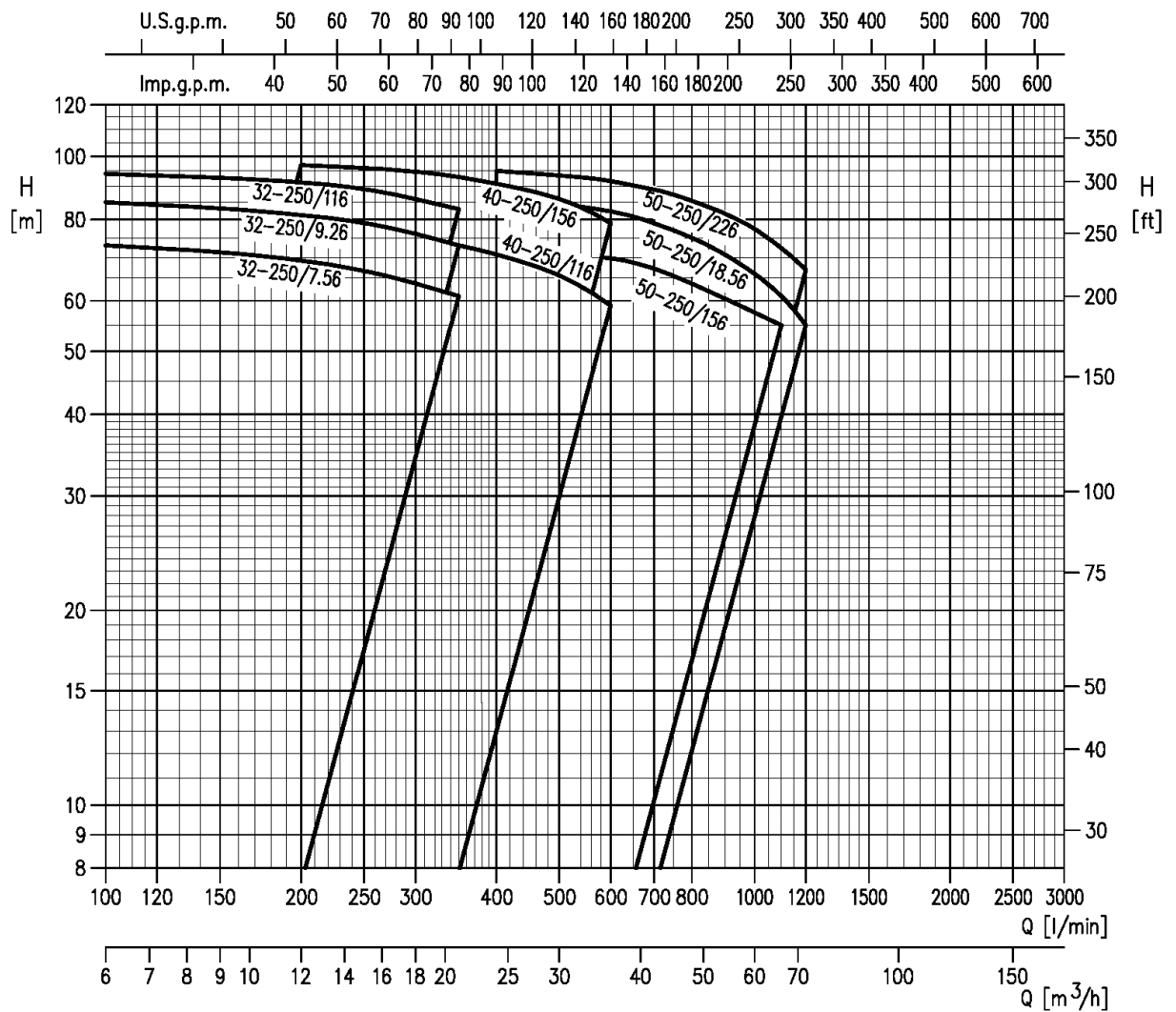
MOTOR		
Type	Electric - TEFC	
	Three Phase	
Efficiency Level	- from 7.5 up to 22 kW IE3* from 7,5 up to 22 kW (* only for 460V)	
No. of Poles	2	
Rotation speed [min-1]	~ 3450	
Insulation Class	F	
Protection degree	IP 55	
Power rating [kW]	7.5 ÷ 22	
	[HP]	
	10 ÷ 30	
Frequency [Hz]	60	
Voltage [V]	220/380 ±10% (from 7.5 up to 22 kW) 220/380-460 ±10% (IE3* from 7.5 up to 22 kW)	
Overload protection	Provided by the user	
Casing material	Aluminium	
Base material/motor support	Aluminium / Steel	
Dimensions of cable entry	PG 13.5 - PG 16 - PG 21 – M20x1.5 (see page 400)	

PERFORMANCE RANGE and SELECTION CHART

60Hz

Rev. K

PERFORMANCE RANGE



SELECTION CHART

Pump type	Output		Q=Capacity																								
			l/min	0	100	200	250	280	350	400	550	600	667	700	800	1000	1100	1200	1250	1400	1900	2000	2200	2300	2400		
	kW	HP	m³/h	0	6	12	15	17	21	24	33	36	40	42	48	60	66	72	75	84	114	120	132	138	144		
H=Total manometric head in meters																											
MD 32-250/7.56	7,5	10	74	73	69	66.5	65	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MD 32-250/9.26	9,2	12,5	86	85	81.5	79	77.5	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MD 32-250/116	11	15	95	94	91.5	89	87.5	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MD 40-250/116	11	15	79	-	77	76	75	73	70.5	62	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MD 40-250/156	15	20	99	-	97	96	95.5	93	91	82	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MD 50-250/156	15	20	76	-	-	-	-	-	75	74	72	70	69	67	59	55	-	-	-	-	-	-	-	-	-	-	
MD 50-250/18.56	18,5	25	86.5	-	-	-	-	-	85	83	81.5	80	78.5	75	66.5	61	55	-	-	-	-	-	-	-	-	-	
MD 50-250/226	22	30	96.5	-	-	-	-	-	95	93	92	90	89	85.5	77.5	72.5	67	-	-	-	-	-	-	-	-	-	

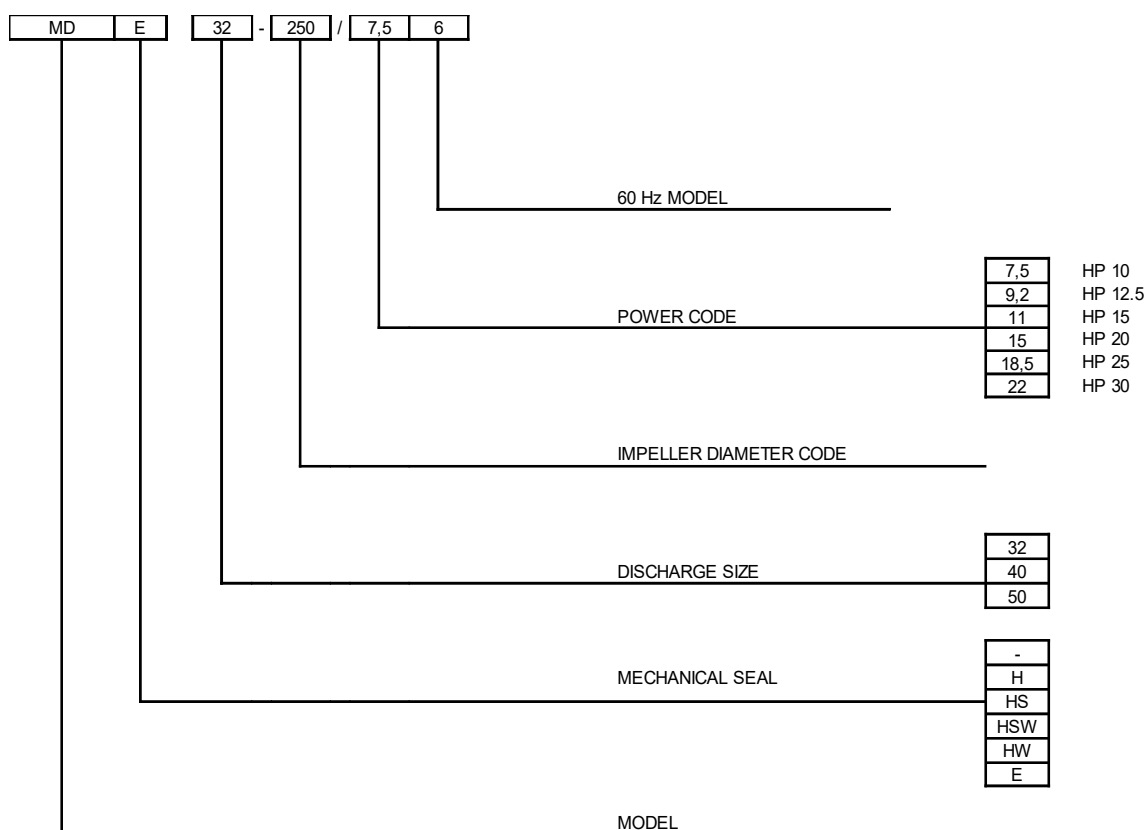
Three phase standard voltage: 220/380V -6% +10%
 380-460/660 ±6%
 220/380 -6 +10%

TYPE KEY and CURVE SPECIFICATIONS

60Hz

Rev. K

TYPE KEY



CURVE SPECIFICATIONS

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

Tolerances according to ISO 9906:2012 - Grade 3B

The curves refer to effective speed of asynchronous motors at 60 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.

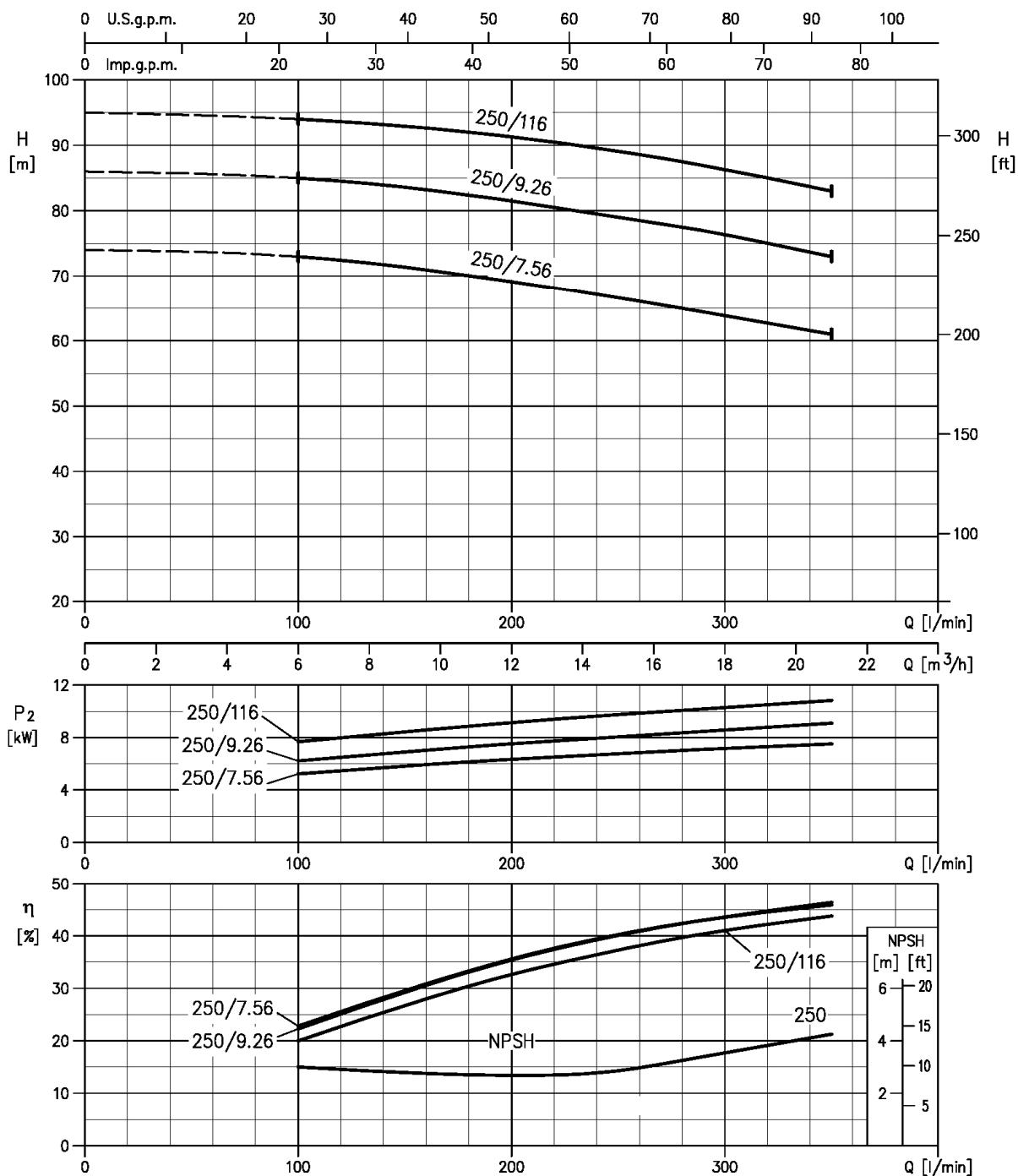
Symbols explanation:

- 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

MD 32-250/7.56 (7.5 kW) - Impeller diameter = 200 mm

MD 32-250/9.26 (9.2 kW) - Impeller diameter = 215 mm

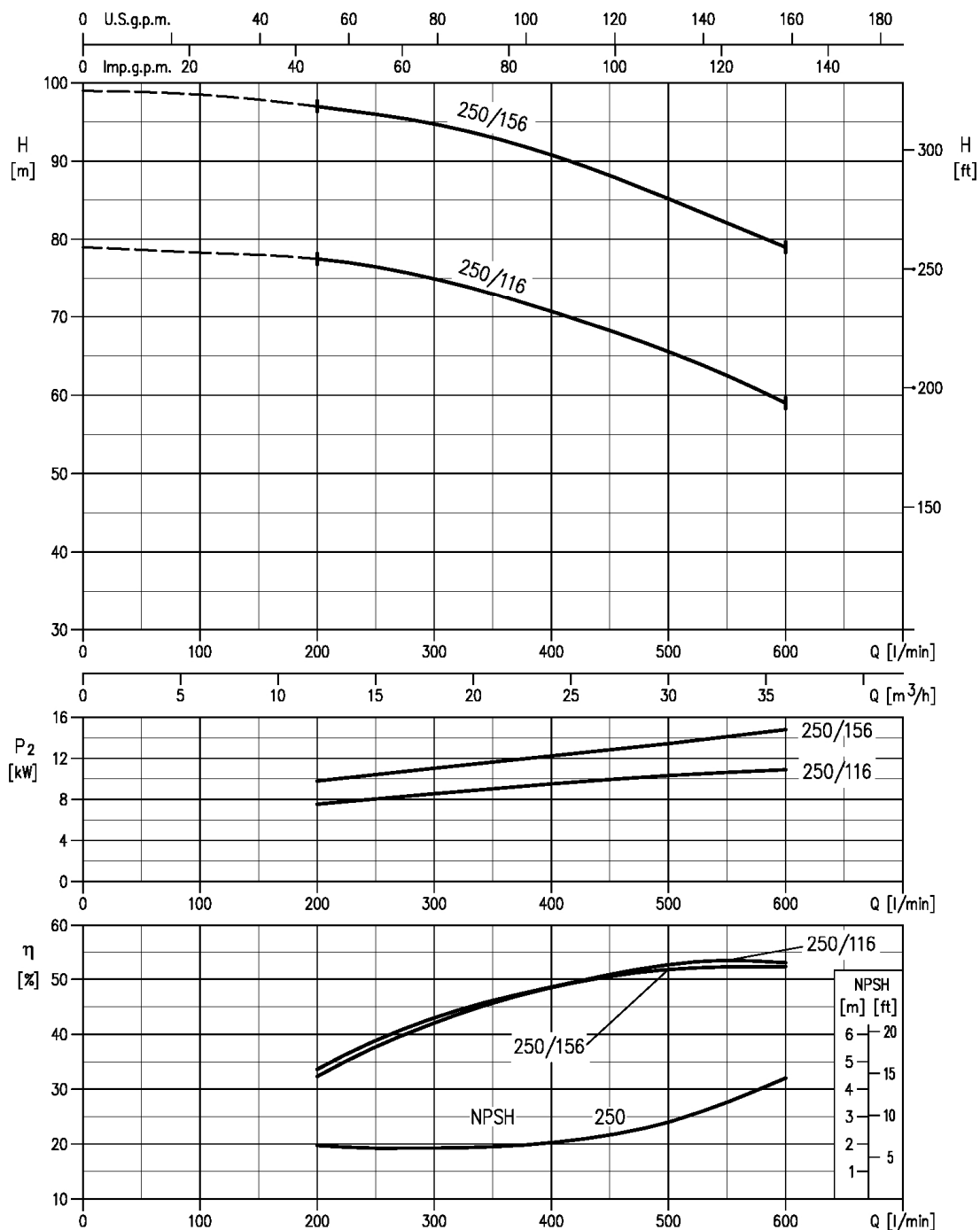
MD 32-250/116 (11 kW) - Impeller diameter = 225 mm

Rotation speed $\approx 3450 \text{ min}^{-1}$

Test standard: ISO 9906:2012 - Grade 3B

MD 40-250/116 (11 kW) - Impeller diameter = 202 mm

MD 40-250/156 (15 kW) - Impeller diameter = 222 mm

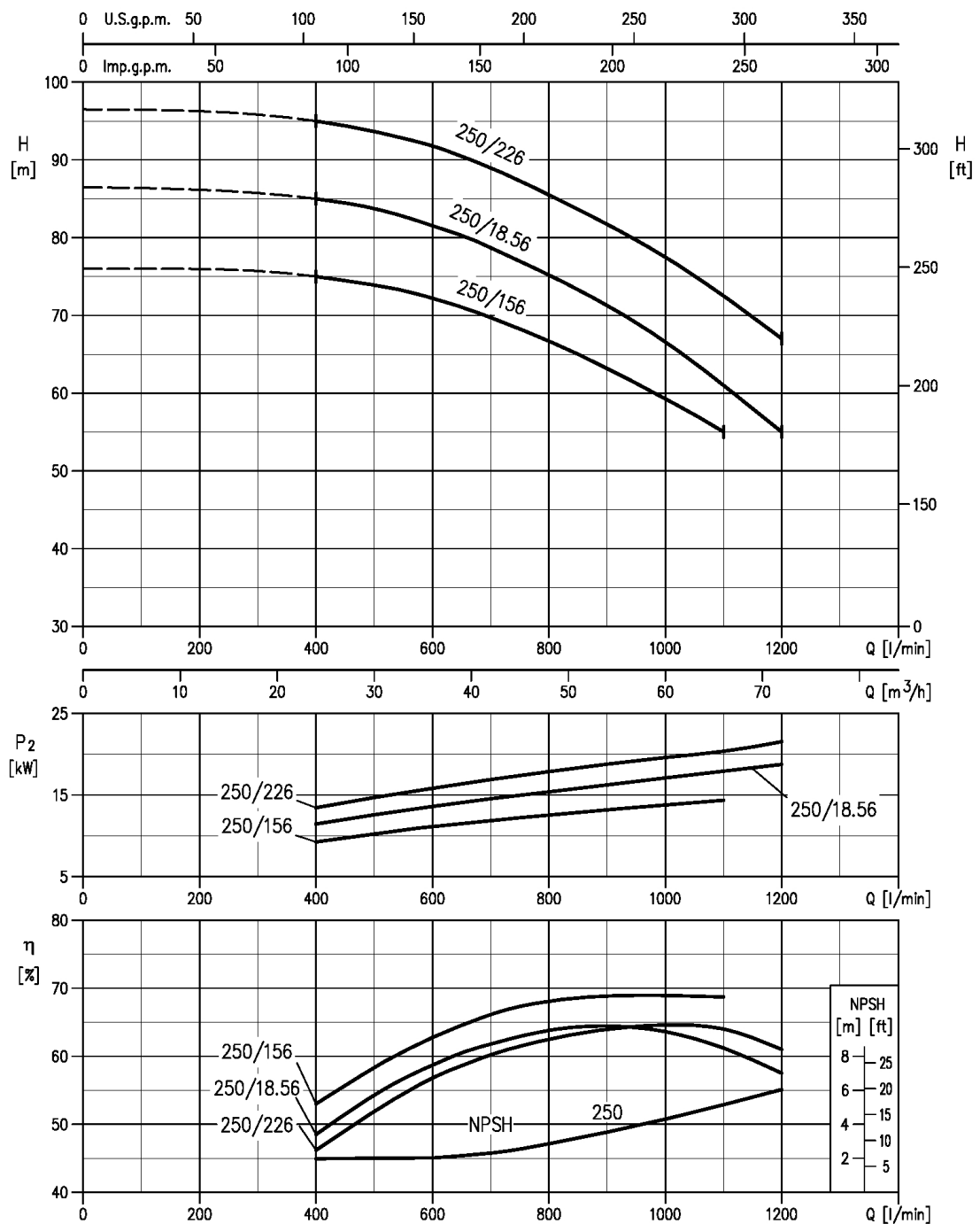
Rotation speed $\approx 3450 \text{ min}^{-1}$

Test standard: ISO 9906:2012 - Grade 3B

MD 50-250/156 (15 kW) - Impeller diameter = 198 mm

MD 50-250/18.56 (18.5 kW) - Impeller diameter = 208 mm

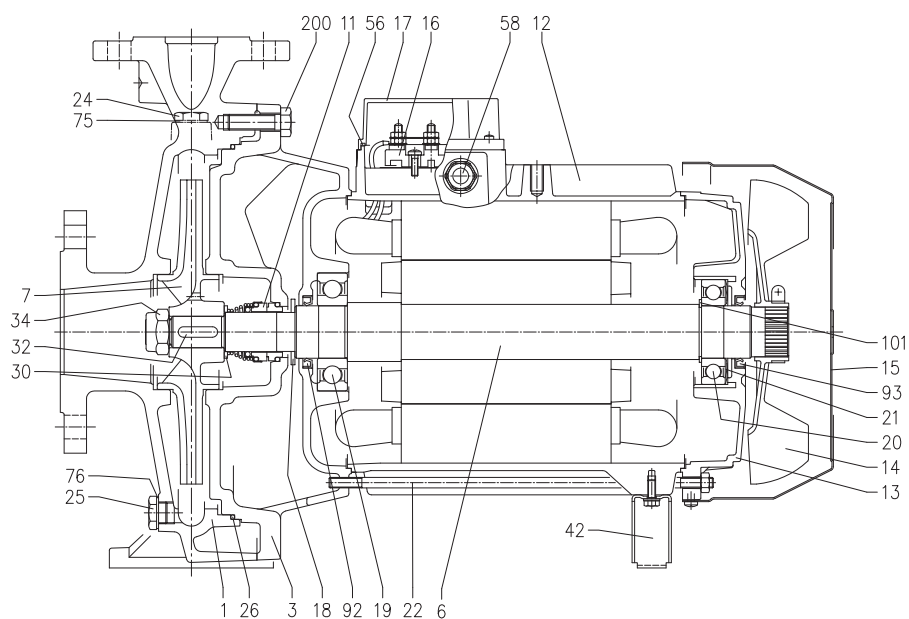
MD 50-250/226 (22 kW) - Impeller diameter = 218 mm

Rotation speed $\approx 3450 \text{ min}^{-1}$

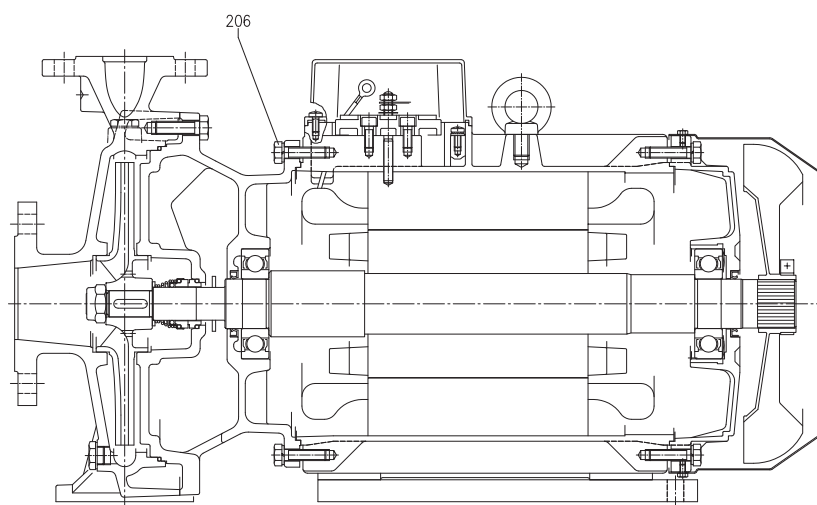
Test standard: ISO 9906:2012 - Grade 3B

SECTIONAL VIEW DRAWING

UP TO 11 kW



15 kW AND ABOVE



SECTIONAL VIEW TABLE

N°	PART NAME	MATERIAL	DIMENSIONS	STANDARD	N. FOR 1 UNIT
1	Casing	Cast iron EN-GJL-200-EN 1561			1
3	Motor bracket	Cast iron EN-GJL-200-EN 1561			1
6	Shaft with rotor	AISI 304 (Part in contact with liquid)			1
7	Impeller	AISI 304			1
11	Mechanical seal [1]	Carbon/Ceramic/NBR			1
12	Motor frame with stator	-			1
13	Motor cover	Aluminium			1
14	Fan	PP			1
15	Fan cover	Fe P04 Zincate			1
16	Terminal box	-			1
17	Terminal box cover	Aluminium			1
18	Splash ring	NBR	40x21.5x3	EPE DRAWING	1
	Up to 7.5 kW 9.2 kW and above		50x29.5x3		
19	Pump side ball bearing	-	See table p.302		1
20	Fan side ball bearing	-	See table p.302		1
21	Adjusting ring	Steel C70			1
	Tie rod	Fe 42 Zincate		EPE DRAWING	4
22	Screw	Zincate steel 8.8 strenght class ISO 898/1		UNI 5739	
24	Priming plug	Brass		EPE DRAWING	1
25	Drain plug	Brass		EPE DRAWING	1
26	O-ring	NBR [2]	277x3,53	EPE DRAWING	1
30	Spacer	AISI 304	22,5x26,9x2,5 (up to 7,5kW) 30,5x40x2,5 (9,2 kW and above)	EPE DRAWING	1
32	Key	AISI 316	6x6x25 (up to 7,5kW) 8x7x30 (9,2 kW and above)	UNI 6604	1
34	Impeller nut	AISI 304	M16x1,5 (up to 7,5kW) M20x1,5 (9,2 kW and above)	UNI 7474	1
42	Foot	Fe P04		EPE DRAWING	1
56	Box gasket	NBR			1
58	Cable entry	-			1
75	Washer	Aluminium	Ø 17 - G3/8		1
76	Washer	Aluminium	Ø 17 - G3/8		1
85*	Kit counterflange	Flange	Zincate steel	See table p.306	EPE DRAWING
		Screw for flange	AISI 304	M16x55	UNI 5737
		Gasket	EPDM	See table p.306	2
92	Lip seal	-	7,5 kW	30x47x7	DIN 3760 without spring
			9,2 kW	40x55x7	
			From 15 to 22 kW	45x60x7	
93	Lip seal	-	7,5 kW	30x47x7	DIN 3760 without spring
			9,2 kW	40x55x7	
			From 15 to 22 kW	45x60x7	
101	Snap ring (only for 9,2-11 kW)	Carbon tool steels TC 80	Ø 40	UNI 7435	1
200	Screw	Zincate steel 8.8 strenght class ISO 898/1	M12x40	UNI 5739	12
206	Screw	Zincate steel 8.8 strenght class ISO 898/1	M10x40	UNI 5739	4

[1] See CONSTRUCTIONS MECHANICAL SEAL p. 303

[2] FPM for H-HS-HSW-HW version

EPDM for E version

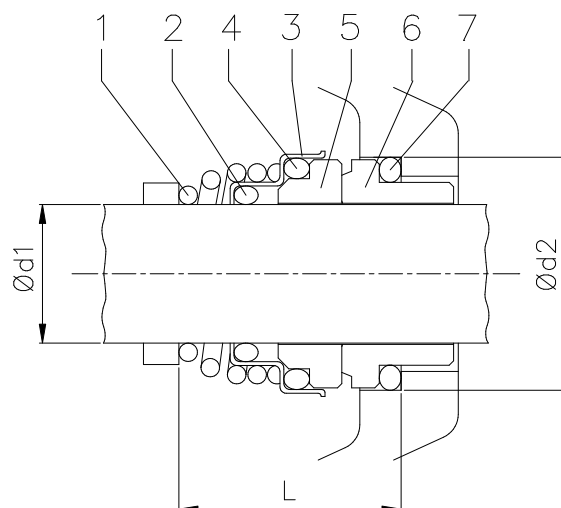
*On request

BEARINGS

Pump type	Ball Bearing			
	Pump side	(*) Pump side	Fan side	(*) Fan side
MD 32-250/7.56	6306 2RSH	6306 ZZC3WT	6206 2RSH	6206 ZZC3WT
MD 32-250/9.26	6308 2RSH	6308 ZZC3WT	6208 2RSH	6208 ZZC3WT
MD 32-250/116				
MD 40-250/116				
MD 40-250/156	6309 2RSH	6309 ZZC3WT	6309 2RSH	6309 ZZC3WT
MD 50-250/156				
MD 50-250/18,56				
MD 50-250/226				

(*) Only for IE3 motors

MECHANICAL SEAL



REF	PART NAME	Standard version	MATERIAL				
			Optional				
			(H)	(HS)	(HSW)	(HW)	(E)
1	Self driving spring	AISI 316	AISI 316	AISI 316	AISI 316	AISI 316	AISI 316
2	O Ring	NBR	FPM	FPM	FPM	FPM	EPDM
3	Frame	AISI 304	AISI 304/AISI 316*	AISI 316	AISI 316	AISI 316	AISI 304
4	O Ring	NBR	FPM	FPM	FPM	FPM	EPDM
5	Rotary seal ring	ceramic	ceramic	SiC	Tungsten carbide	Tungsten carbide	ceramic
6	Stationary seal ring	carbon graphite	carbon graphite	SiC	Tungsten carbide	Tungsten carbide	carbon graphite
7	O Ring	NBR	FPM	FPM	FPM	FPM	EPDM

*Only for Ø 30

Pump type	Dimensions mm		
	Ø d1	Ø d2	L
MD 32-250/7.56	22	37	37,5
MD 32-250/9.26	30	45	42,5
MD 32-250/116			
MD 40-250/116			
MD 40-250/156			
MD 50-250/156			
MD 50-250/18,56			
MD 50-250/226			

FLUID TEMPERATURE RANGE

The maximum allowable temperature for the pumped fluid is a determining factor for the operational life of the pump. A primary role in this limitation is played by the materials of the mechanical seals (rings and elastomers), whose thermal resistance often defines the upper limit. The general construction materials of the pump (casing, impeller) and the lubricant used also contribute to defining the maximum temperature. Although the fluid properties and operating conditions have an impact, the choice of suitable seal materials for the operating temperature is crucial to prevent leaks and ensure the reliability of the pumping system.

To preserve optimal performance and prevent failures, we recommend to operate within the following limits:

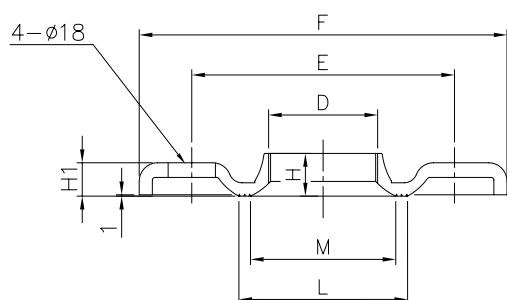
STANDARD mechanical seal	TEMPERATURE	
	MIN	MAX
STANDARD	-5 °C	90 °C

OPTIONAL mechanical seal	TEMPERATURE	
	MIN	MAX
H *	-5 °C	110 °C
HS *	-5 °C	110 °C
HW *	-5 °C	110 °C
HSW *	-5 °C	110 °C
E	-5 °C	120 °C

* in case the pumped fluid is water in combination to FPM elastomers, a maximum temperature fluid of 75°C is recommended in order to guarantee a longer life of the sealing parts

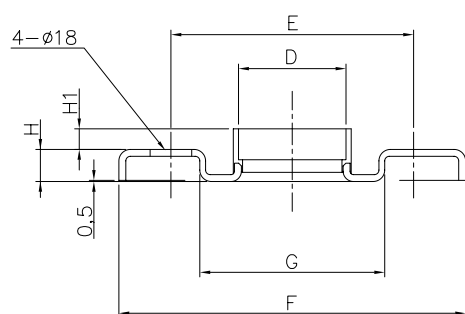
FITTINGS

ZINCATE STEEL COUNTER FLANGE (STANDARD)



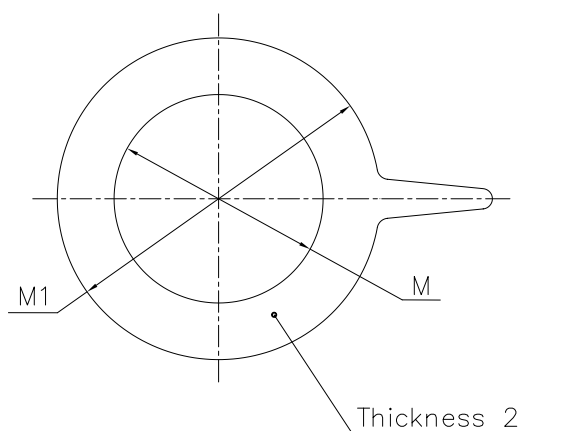
DN	D	E	F	H	H1	L	M
32	G 1 1/4	100	140	15	11,5	67	50
40	G 1 1/2	110	150	17,5	11,5	72	58
50	G 2	125	165	19	15	89	70

AISI 304 –AISI 316L COUNTER FLANGE (ON REQUEST)



DN	D	E	F	G	H	H1
32	G 1 1/4	100	140	76	14	15,5
40	G 1 1/2	110	150	81	14	15,5
50	G 2	125	165	96	16	18

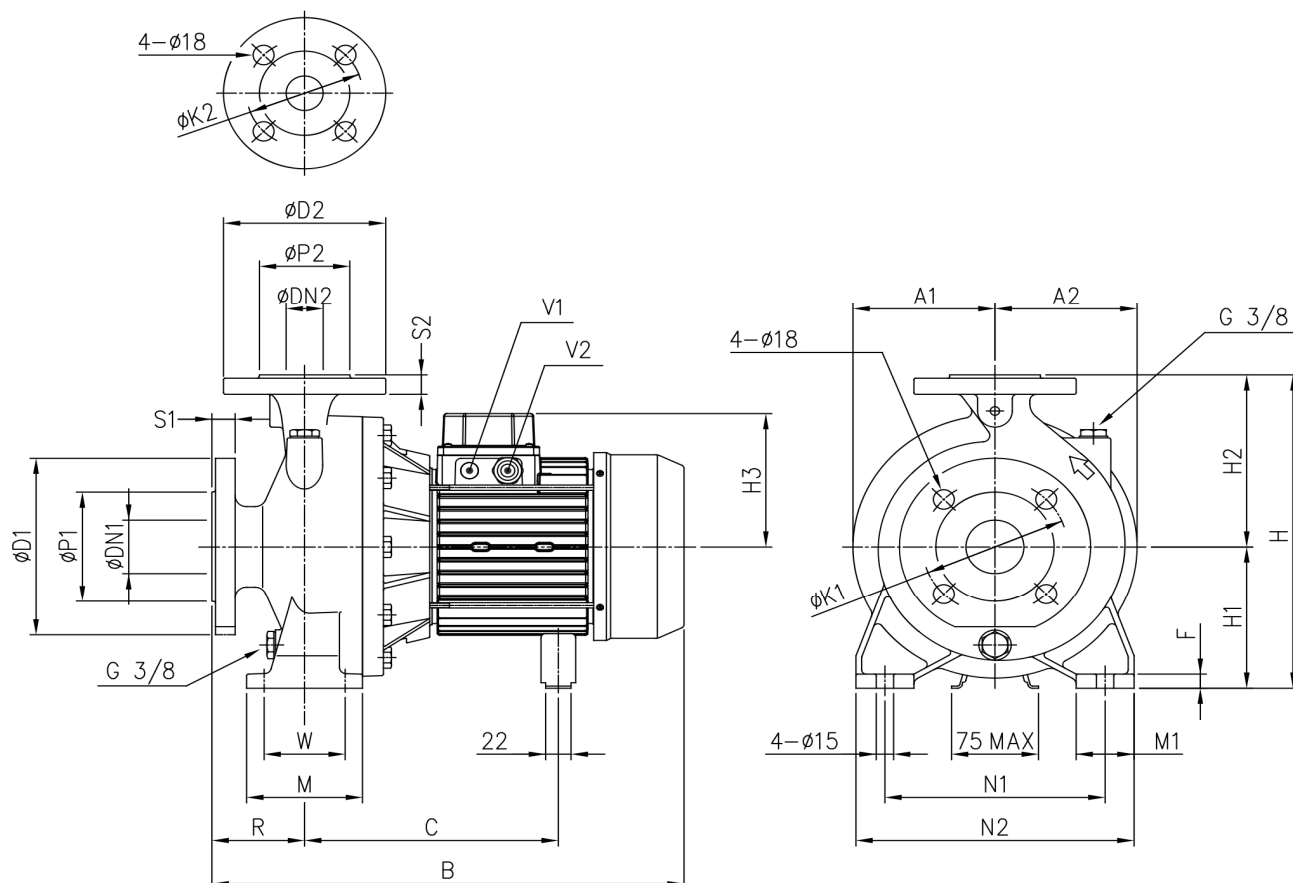
GASKET



DN	M	M1
32	38	82
40	50	93
50	60	107

Material : EPDM version for standard
FPM version for hot water maximum 110°C

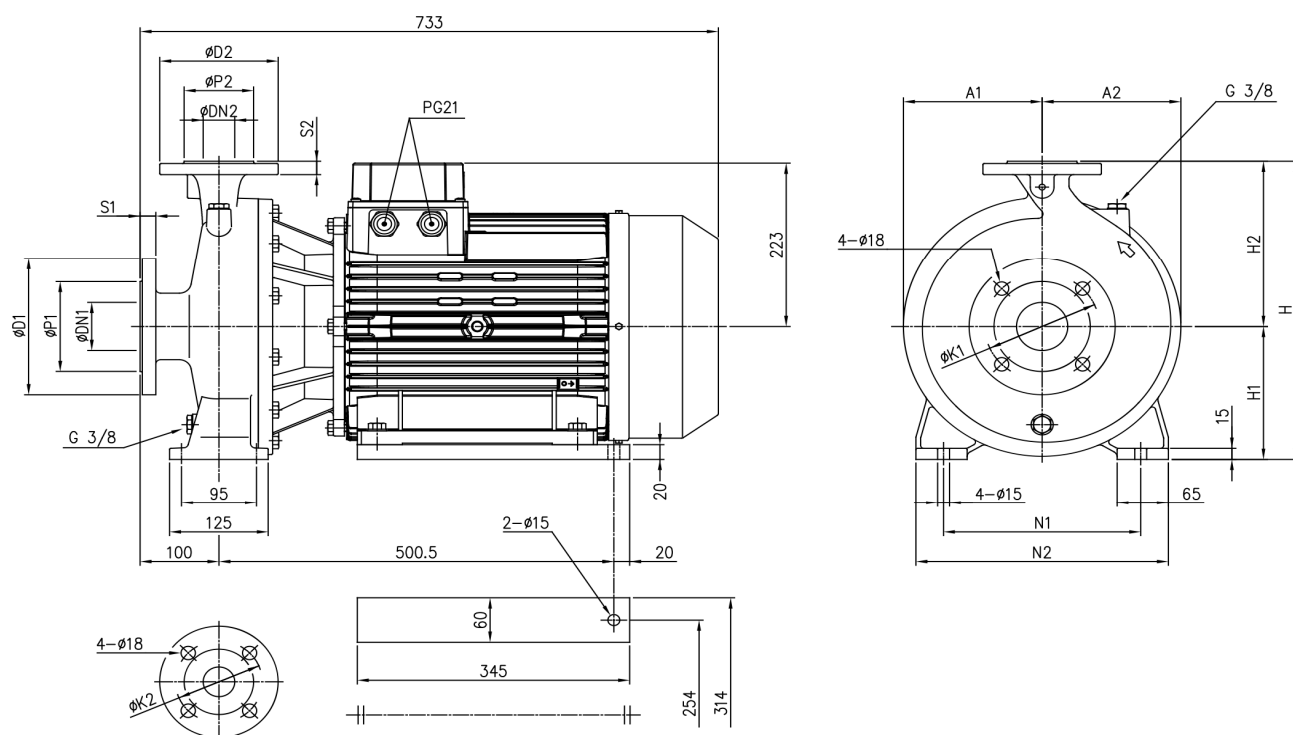
PUMP MD 32-250 / 40-250



Model	Dimensions (mm)																										Weight [kgf]			
	Ø DN1	Ø P1	Ø K1	Ø D1	S1	Ø DN2	Ø P2	Ø K2	Ø D2	S2	H	H1	H2	H3	R	W	M	M1	N1	N2	A1	A2	B (*)		C	F	V1	V2		(*)
MD 32-250/7.56	50	102	125	165	20	32	78	100	140	18	405	180	225	150	100	95	125	65	250	320	176	176	539	559	275	15	PG 13.5	PG 16	74	74,7
MD 32-250/9.26	50	102	125	165	20	32	78	100	140	18	405	180	225	178	100	95	125	65	250	320	176	176	590	590	354	15	PG 13.5	PG 21	94	94
MD 32-250/116	50	102	125	165	20	32	78	100	140	18	405	180	225	178	100	95	125	65	250	320	176	176	590	590	354	15	PG 13.5	PG 21	93,5	96
MD 40-250/116	65	122	145	185	20	40	88	110	150	18	405	180	225	178	100	95	125	65	250	320	176	176	590	590	354	15	PG 13.5	PG 21	97,5	100

(*) Only for IE3 motors

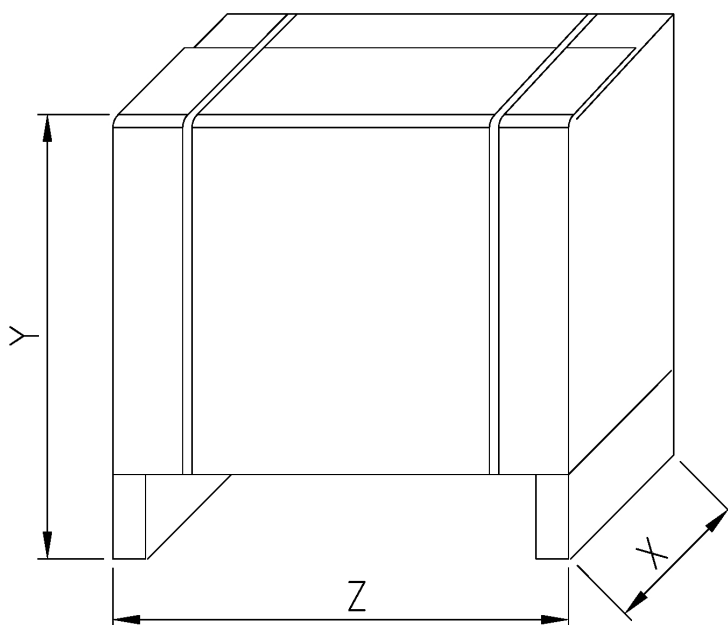
PUMP MD 40-250 / 50-250



Model	Dimensions [mm]																	Weight	
	Ø DN1	Ø P1	Ø K1	Ø D1	S1	Ø DN2	Ø P2	Ø K2	Ø D2	S2	H	H1	H2	N1	N2	A1	A2	[kgf]	(*)
MD 40-250/156	65	122	145	185	20	40	88	110	150	18	405	180	225	250	320	176	176	101	104,1
MD 50-250/156	65	122	145	185	20	50	102	125	165	20	405	180	225	250	320	176	176	102	105,1
MD 50-250/18.56	65	122	145	185	20	50	102	125	165	20	405	180	225	250	320	176	176	129	135,3
MD 50-250/226	65	122	145	185	20	50	102	125	165	20	405	180	225	250	320	176	176	154	160,1

(*) Only for IE3 motors

PACKING



Pump type	Packing [mm]			Weight [kgf]	
	X	Y	Z		(*)
MD 32-250/7.56	390	535	570	79,5	80,2
MD 32-250/9.26	390	535	670	99,5	99,5
MD 32-250/116	390	535	670	101	103,5
MD 40-250/116	390	535	670	103	105,5
MD 40-250/156	390	590	850	107	110
MD 50-250/156	390	590	850	108	111
MD 50-250/18.56	390	590	850	135	141,3
MD 50-250/226	390	590	850	161	166

(*) Only for IE3 motors

MOTOR DATA

Pump type	Power		Efficiency	Efficiency (% load)			Efficiency (% load)			Input [kW]	Full load current			Locked rotor current		
	[kW]	[HP]		Three phase (380 V)			Three phase (460 V)				Three Phase			[A]		
				η %			η %									
				50%	75%	100%	50%	75%	100%		380 V	460 V	660 V	380 V	460 V	660 V
MD 32-250/7.56	7,5	10	-	90,0	90,6	90,3	82,6	86,1	87,5	9,40	14,9	12,7	8,6	121,4	147,0	84,9
MD 32-250/7.56	7,5	10	IE3*	90,0	90,6	90,3	88,1	90,3	90,8	8,30	13,6	11,9	7,8	118,0	143,0	68,1
MD 32-250/9.26	9,2	12,5	-	87,3	88,8	88,6	85,9	88,7	89,6	11,30	17,7	15,4	10,3	125,6	152,0	87,8
MD 32-250/9.26	9,2	12,5	IE3*	90,3	91,2	91,2	88,3	90,5	91,3	10,06	16,9	14,9	9,7	115,0	140,0	66,4
MD 32-250/116	11	15	-	91,9	91,8	91,2	90,9	92,0	91,9	13,20	18,3	18,3	10,5	132,2	160,0	92,4
MD 32-250/116	11	15	IE3*	91,9	91,8	91,2	90,9	91,8	91,3	12,11	20,3	18,5	11,7	153,0	185,0	88,3
MD 40-250/116	11	15	-	91,9	91,8	91,2	90,9	92,0	91,9	13,20	18,3	18,3	10,5	132,2	160,0	92,4
MD 40-250/116	11	15	IE3*	91,9	91,8	91,2	90,9	91,8	91,3	12,11	20,3	18,5	11,7	153,0	185,0	88,3
MD 40-250/156	15	20	-	90,9	91,5	91,0	89,4	91,3	91,8	17,90	28,7	25,0	16,6	198,3	240,0	138,6
MD 40-250/156	15	20	IE3*	92,5	92,7	92,1	91,0	92,5	92,7	16,23	27,1	23,9	15,7	184,0	223,0	106,2
MD 40-250/156	15	20	-	90,9	91,5	91,0	89,4	91,3	91,8	17,90	28,7	25,0	16,6	198,3	240,0	138,6
MD 50-250/156	15	20	IE3*	92,5	92,7	92,1	91,0	92,5	92,7	16,23	27,1	23,9	15,7	184,0	223,0	106,2
MD 50-250/18,56	18,5	25	-	91,7	92,8	92,5	90,3	92,1	92,9	21,90	34,8	31,0	20,1	271,0	328,0	189,4
MD 50-250/18,56	18,5	25	IE3*	92,2	92,9	92,7	90,8	92,5	92,9	19,91	33,5	30,3	19,3	273,0	331,0	157,6
MD 50-250/226	22	30	-	89,7	91,2	91,3	88,4	91,0	91,7	26,40	41,7	36,4	24,0	316,4	383,0	221,1
MD 50-250/226	22	30	IE3*	92,4	92,7	92,7	92,6	93,1	93,1	23,65	39,5	34,5	22,8	321,0	389,0	185,3

* only for 460V



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