



# EM SERIES 50 Hz

VERTICAL CLOSE-COUPLED MULTISTAGE PUMPS





# INDEX

<b>Vertical close-coupled multistage pumps.....</b>	<b>2</b>
Family curves.....	3
Pump identification code.....	3
<b>Spare parts and material.....</b>	<b>4</b>
<b>Tables of hydraulic performance at 50 Hz.....</b>	<b>5</b>
Single-phase version.....	5
Three-phase version.....	6
<b>Mechanical seal specifications.....</b>	<b>7</b>
<b>Motor specifications.....</b>	<b>8</b>
Motor spare parts.....	9
<b>Technical data and performance curves.....</b>	<b>11</b>
EM 3.....	12
EM 5.....	14
EM 9.....	16

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# VERTICAL CLOSE-COUPLED MULTISTAGE PUMPS

## APPLICATIONS

- Small domestic and industrial systems / Domestic water supply
- Water distribution / pressure boosting
- Irrigation / Gardening / Sprinklers / Rainwater collection
- Industrial plants / Wash down unit
- Cooling and chilling / Heating and conditioning / Air conditioning systems
- Pumping of clear non-loaded fluids
- Other various installations

## FEATURES

- Compact close-coupled design, robust and corrosion resistant / Superior efficiency and performance
- Floating neck ring in PPS
- Heavy duty oversize motor shaft
- Impellers and diffusers are made of stainless steel in order to achieve durability
- Easy maintenance
- Strong and sealed motor ball bearing fitted in the motor
- Mechanical seal Type E0 = Carbon graphite / Ceramic Alumina /EPDM

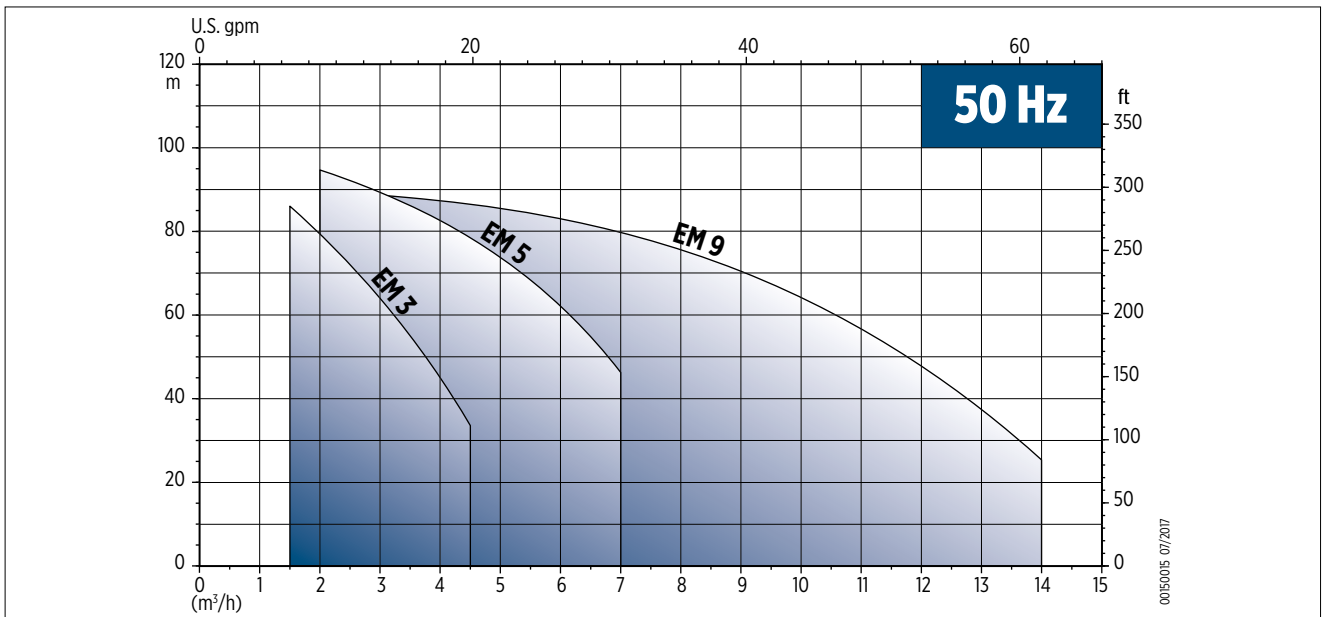
## PUMP SPECIFICATIONS

- Flow: up to 14 m<sup>3</sup>/h
- Head: up to 104 m
- Discharge and Suction ports: Threaded or Oval connections
- Maximum working pressure: 12 Bar
- Direction of rotation: clockwise looking at the pump from the top down
- Maximum ambient temperature: 40 °C
- Liquid temperature range:
  - Minimum: - 15 °C
  - Maximum: + 90 °C for domestic use (uses covered by EN standard 60335-2-41);  
+ 110 °C only for industrial use (uses other than those covered by EN standard 60335-2-41)
- The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

## MOTOR SPECIFICATIONS

- Single-phase
- Three-phase motors efficiency class IE3
- Asynchronous, TEFC (Totally Enclosed, Fan-Cooled)
- 2 pole
- Protection degree: IP55
- Insulation class: F

### FAMILY CURVES

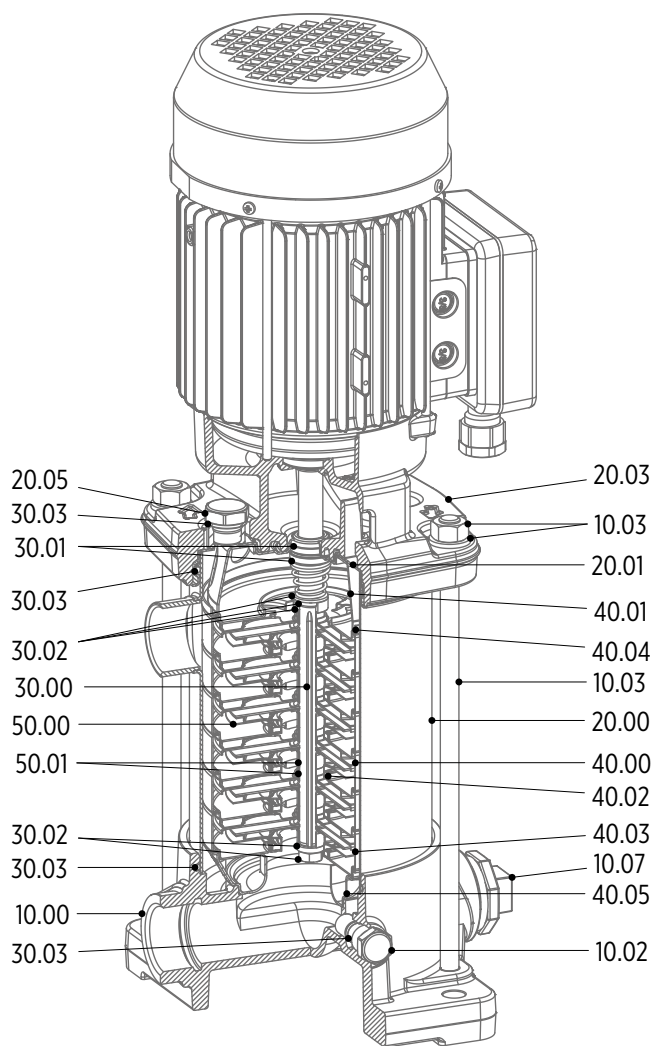


### PUMP IDENTIFICATION CODE

EM 5 / 05 D G 011 T 6 E0

- EM - Pump model
- 5 - Nominal flow rate in m³/h
- / - Number of stages
- 05 - Connection configurations: "R" (second threaded delivery port puts on top), "T" (In-line oval flange), "D" (In-line threaded)
- D - Pump material: "G" (Cast iron / AISI 304)
- G - Motor power (kWx10)
- 011 - "T" (three-phase); "M" (single-phase)
- T - Frequency: "5" (50 Hz); "6" (60 Hz)
- 6 - Mechanical seal type
- E0 - Pump speciality - Standard configuration if empty
- 0 - Three-phase motor efficiency (IE3)

# SPARE PARTS AND MATERIAL



## SPARE PARTS

Ref. No.	Part description
10.00	Pump casing
10.02	Draining plug
10.03	Tie bolts, washers and nuts
10.07	Pump casing plug*
20.00	Outer case
20.01	Mechanical seal housing
20.03	Motor bracket
20.05	Filling plug
30.00	Pump shaft
30.01	Kit mechanical seal
30.02	Mechanical seal fastening kit
30.03	Kit O-rings
40.00	Stage housing and diffuser
40.01	Stage Centering outlet
40.02	Floating neck ring
40.03	Initial stage housing
40.04	Last Stage with diffuser
40.05	Stage Centering inlet
50.00	Impeller
50.01	Impeller spacer

\* Only for R version

## PARTS IN CONTACT WITH LIQUID

Ref. No.	Part description	Material	Standard	
			ASTM/AISI	DIN/EN
10.00	Pump casing	Cast Iron	A48 Class 35	GJL-250
10.02	Draining plug	Stainless Steel	AISI 304	1.4301
10.07	Pump casing plug*	Zinc coated steel	-	-
20.00	Outer case	Stainless Steel	AISI 304	1.4301
20.01	Mechanical seal housing	Stainless Steel	AISI 304	1.4301
20.05	Filling plug	Stainless Steel	AISI 304	1.4301
30.00	Pump shaft	Stainless Steel	AISI 304	1.4301
30.01	Kit mechanical seal	Ceramic / Carbon graphite / EPDM	-	-
30.02	Mechanical seal fastening kit	Stainless Steel	AISI 304	1.4301
30.03	Kit O-rings	EPDM	-	-
40.00	Stage housing and diffuser	Stainless Steel	AISI 304	1.4301
40.01	Stage Centering outlet	Stainless Steel	AISI 304	1.4301
40.02	Floating neck ring	Stainless steel, PPS	AISI 304	1.4301
40.03	Initial stage housing	Stainless Steel	AISI 304	1.4301
40.04	Last Stage with diffuser	Stainless Steel	AISI 304	1.4301
40.05	Stage Centering inlet	Stainless Steel	AISI 304	1.4301
50.00	Impeller	Stainless Steel	AISI 304	1.4301
50.01	Impeller spacer	Stainless Steel	AISI 304	1.4301

\* Only for R version

# HYDRAULIC PERFORMANCE AT 50 HZ

## SINGLE-PHASE VERSION

Pump model	Q = DELIVERY															
	l/min 0	33.3	41.7	50.0	58.3	66.7	75.0	83.3	91.7	100.0	116.7	133.3	150.0	166.7	183.3	233.3
	m <sup>3</sup> /h 0	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0	9.0	10.0	11.0	14.0
	US GPM 0	8.8	11.0	13.2	15.4	17.6	19.8	22.0	24.2	26.4	30.8	35.2	39.6	44.0	48.4	61.6
H=TOTAL M.HEAD OF WATER COLUMN [m]																
EM 3/2	22.5	19.0	17.6	15.9	14.1	12.1	9.9									
EM 3/3	33.4	27.9	25.7	23.2	20.4	17.4	14.1									
EM 3/4	44.1	36.3	33.3	29.9	26.2	22.1	17.7									
EM 3/5	54.6	44.2	40.3	36.0	31.3	26.2	20.7									
EM 3/6	66.5	55.1	50.5	45.5	39.9	33.8	27.2									
EM 3/7	77.1	63.3	57.9	51.9	45.4	38.3	30.5									
EM 3/8	88.8	73.2	67.0	60.2	52.7	44.5	35.7									
EM 3/9	99.5	81.2	74.0	66.2	57.7	48.5	38.6									
EM 5/2	22.8		20.8	20.2	19.6	18.8	18.0	17.0	16.0	14.7	11.6					
EM 5/3	33.9		30.5	29.5	28.4	27.2	25.9	24.4	22.8	20.9	16.1					
EM 5/4	45.6		41.3	40.1	38.7	37.1	35.4	33.5	31.3	28.8	22.5					
EM 5/5	56.6		50.8	49.2	47.4	45.3	43.1	40.6	37.9	34.7	26.7					
EM 5/6	68.2		61.4	59.5	57.2	54.7	52.0	49.0	45.7	41.9	32.3					
EM 5/7	79.2		70.6	68.2	65.4	62.4	59.0	55.4	51.4	46.9	35.6					
EM 5/8	91.7		83.8	81.6	78.9	75.9	72.5	68.7	64.5	59.6	47.2					
EM 5/9	103.0		93.8	91.2	88.1	84.6	80.8	76.5	71.7	66.1	52.1					
EM 9/2	23.4			21.9	21.6	21.3	21.0	20.6	20.3	19.9	19.1	18.3	17.1	15.7	13.8	6.6
EM 9/3	35.2			33.1	32.8	32.3	31.8	31.2	30.7	30.2	29.1	27.8	26.2	24.0	21.2	10.4
EM 9/4	47.1			44.3	43.9	43.3	42.6	41.9	41.2	40.5	39.1	37.4	35.2	32.4	28.7	14.3
EM 9/5	59.4			56.5	56.0	55.4	54.6	53.8	53.0	52.3	50.6	48.7	46.2	42.8	38.3	20.6
EM 9/6	71.0			67.3	66.6	65.9	64.9	63.8	62.9	61.9	59.8	57.4	54.2	50.1	44.6	23.2

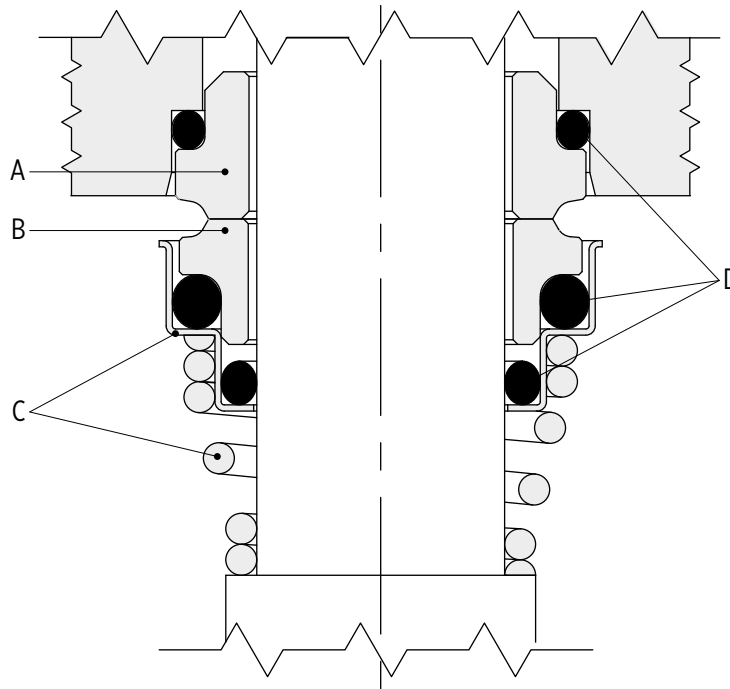
### THREE-PHASE VERSION

Pump model	Q = DELIVERY															
	l/min 0	33.3	41.7	50.0	58.3	66.7	75.0	83.3	91.7	100.0	116.7	133.3	150.0	166.7	183.3	233.3
	m <sup>3</sup> /h 0	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0	9.0	10.0	11.0	14.0
	US GMP 0	8.8	11.0	13.2	15.4	17.6	19.8	22.0	24.2	26.4	30.8	35.2	39.6	44.0	48.4	61.6
H=TOTAL M.HEAD OF WATER COLUMN [m]																
EM 3/2	22.7	19.2	17.7	16.1	14.2	12.2	10.0									
EM 3/3	33.7	28.1	25.9	23.4	20.6	17.6	14.2									
EM 3/4	44.4	36.6	33.6	30.2	26.5	22.4	18.0									
EM 3/5	54.9	44.7	40.8	36.6	31.9	26.9	21.3									
EM 3/6	66.1	54.2	49.6	44.5	38.9	32.8	26.2									
EM 3/7	76.6	62.1	56.6	50.6	44.1	37.0	29.3									
EM 3/8	88.9	73.7	67.7	61.0	53.6	45.5	36.7									
EM 3/9	99.5	82.1	75.3	67.7	59.4	50.2	40.3									
EM 5/2	23.0		21.0	20.4	19.7	18.9	18.1	17.2	16.1	14.9	11.8					
EM 5/3	34.1		30.7	29.7	28.6	27.4	26.1	24.7	23.0	21.2	16.4					
EM 5/4	45.4		40.8	39.6	38.1	36.5	34.8	32.8	30.6	28.1	21.8					
EM 5/5	56.3		50.1	48.4	46.5	44.4	42.2	39.7	36.9	33.7	25.7					
EM 5/6	68.2		61.6	59.8	57.7	55.3	52.7	49.9	46.6	42.9	33.4					
EM 5/7	79.2		71.1	68.9	66.4	63.6	60.5	57.1	53.3	48.9	37.7					
EM 5/8	92.0		84.2	81.9	79.3	76.2	72.9	69.2	65.0	60.1	47.7					
EM 5/9	103.3		94.2	91.6	88.6	85.1	81.3	77.1	72.3	66.8	52.8					
EM 9/2	23.5			22.0	21.8	21.5	21.1	20.8	20.4	20.1	19.3	18.5	17.4	16.0	14.1	6.9
EM 9/3	35.0			32.7	32.3	31.9	31.3	30.7	30.2	29.7	28.5	27.2	25.5	23.3	20.5	9.7
EM 9/4	47.0			44.2	43.8	43.2	42.5	41.8	41.2	40.5	39.0	37.4	35.3	32.5	28.8	14.4
EM 9/5	59.6			56.7	56.2	55.6	54.8	54.0	53.3	52.5	50.8	49.0	46.5	43.2	38.7	21.0
EM 9/6	71.2			67.5	66.9	66.2	65.2	64.2	63.2	62.3	60.2	57.9	54.8	50.8	45.4	24.0
EM 9/7	83.5			79.5	78.8	78.1	76.9	75.8	74.8	73.7	71.4	68.8	65.4	60.7	54.6	29.7
EM 9/8	95.2			90.4	89.6	88.7	87.4	86.1	84.9	83.6	80.9	77.9	73.9	68.5	61.3	32.9





# MECHANICAL SEAL SPECIFICATIONS



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## STANDARD VERSION

Model	Type				Position				Temperature [°C]
					A Stationary part	B Rotating part	C Other components	D Elastomers	
EM 3 - 5 - 9									
E0	V	B	G	E	Ceramic Alumina	Carbon graphite	AISI 316	EPDM	-15 / +110

Type	Material
B	Carbon graphite
E	EPDM
G	AISI 316
V	Ceramic alumina

## MOTOR SPECIFICATIONS

- Asynchronous, TEFC (Totally Enclosed, Fan-Cooled)
- 2 pole
- Protection degree: IP55
- Insulation class: F
- Frequency of starts:
  - Max. 60 starts/hour for motor power up to 3 kW (with min. 1 minute resting time)
  - Max. 30 starts/hour for motor power from 4 kW (with min. 2 minute resting time)

### SINGLE-PHASE VERSION AT 50 HZ

- Standard voltage 220-240 V ± 5%
- Thermal protection built into the motor

P <sub>N</sub> [kW]	MOTOR SIZE	INPUT CURRENT I <sub>N</sub> [A]	Capacitor		230 V - 50 Hz						
			230V	μF	V	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>s</sub> /I <sub>N</sub>	η %	cos φ	T <sub>N</sub> [Nm]	T <sub>s</sub> /T <sub>N</sub>
0.33	71	2.50	16	450	2920	6.5	64.8	0.88	1.08	1.00	1.60
0.45	71	3.00	16	450	2890	5.4	69.7	0.92	1.5	0.72	1.60
0.55	71	3.50	16	450	2860	4.6	72.6	0.94	1.83	0.59	1.85
0.75	71	4.67	16	450	2790	3.5	72.2	0.97	2.56	0.42	1.87
0.9	71	5.45	30	450	2875	4.8	75.3	0.93	3	0.47	1.67
1.1	71	6.60	30	450	2820	3.9	77.0	0.96	3.7	0.38	1.86
1.3	80	7.46	30	450	2860	4.2	80.8	0.94	4.35	0.57	1.86
1.5	80	8.56	30	450	2830	3.6	79.9	0.95	5.05	0.50	1.92
1.85	80	10.90	30	450	2760	2.8	76.6	0.96	6.4	0.39	2.40
2.2	90	12.60	60	450	2870	2.2	76.7	0.99	7.3	0.51	1.99

### THREE-PHASE VERSION AT 50 HZ

- IE3 Premium Efficiency Motors
- IE efficiency according to IEC 60034-30-1:2014
- Electrical performance according to IEC 60034-2-1:2007
- Standard voltage:
  - 220-240 / 380-415 V ± 5 % up to 3 kW
  - 380-415 / 660-690 V ± 5 % from 4 kW
- Thermal protection to be provide into the starter panel by the installer

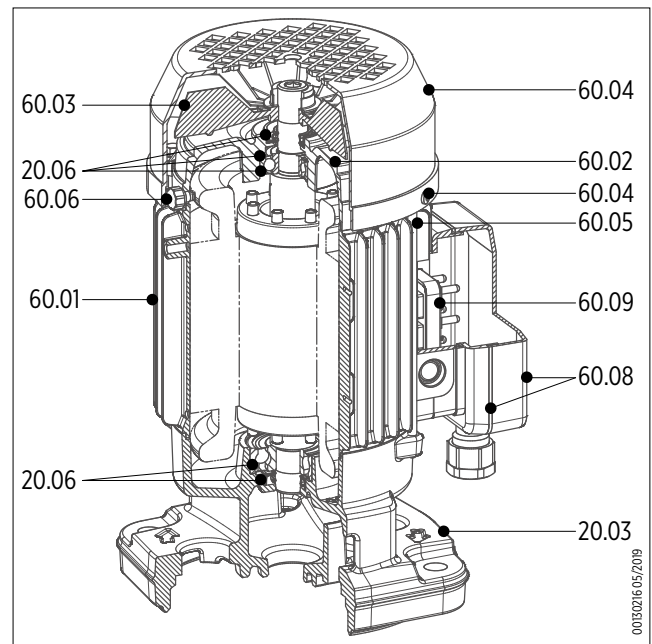
P <sub>N</sub> [kW]	Rendimento / Efficiency η <sub>N</sub> %						IE
	Δ 230 V Y 400 V			Δ 400 V Y 690 V			
	4/4	3/4	2/4	4/4	3/4	2/4	
0.75	80.9	81.5	79.6	-	-	-	3
1.1	82.7	84.6	84.2	-	-	-	
1.5	84.3	85.7	85.3	-	-	-	
2.2	86.1	86.7	85.4	-	-	-	
3	87.1	87.5	86.1	-	-	-	
4	-	-	-	88.1	88.7	87.7	
5.5	-	-	-	89.2	89.4	88.1	

P <sub>N</sub> [kW]	MOTOR SIZE	N. of poles	f <sub>N</sub> [Hz]	400 V 50 Hz				
				cos φ	I <sub>s</sub> / I <sub>N</sub>	T <sub>N</sub> [Nm]	T <sub>s</sub> / T <sub>N</sub>	T <sub>M</sub> / T <sub>N</sub>
0.75	71	2	50	0.83	6.8	2.6	3.6	3.7
1.1	71			0.82	5.9	3.7	3.2	3.1
1.5	80			0.79	6.8	5.1	3.2	3.2
2.2	90			0.8	9.6	7.3	4.3	4.4
3	90			0.83	9.6	9.9	4.7	4.9
4	100			0.85	8.1	13.2	2.8	3
5.5	112			0.81	8.4	18.1	4.3	4.5

P <sub>N</sub> [kW]	VOLTAGE U <sub>N</sub>				n <sub>N</sub> [min <sup>-1</sup> ]	Motor operating conditions		
	Δ 230 V	Y 400 V	Δ 400 V	Y 690 V		Altitude Above Sea Level [m]	T. amb min/max [°C]	ATEX
	I <sub>N</sub> [A]							
0.75	2.8	1.6	-	-	2800	≤ 1000	-15 / +40	No
1.1	4.1	2.3	-	-	2840			
1.5	5.7	3.3	-	-	2830			
2.2	8.0	4.6	-	-	2880			
3	10.4	6.0	-	-	2900			
4	-	-	7.7	4.4	2900			
5.5	-	-	11.0	6.4	2900			

### MOTOR SPARE PARTS

Ref. No.	Part description
20.03	Motor bracket
20.06	Kit bearings
60.01	Motor housing and stator
60.02	Endshield non-drive end
60.03	Fan
60.04	Fan cover and screws
60.05	Motor tie rods
60.06	Kit motor spare components
60.08	Terminal box cover and base
60.09	Terminal board





# Technical data and Performance curves

# EM 3 - TECHNICAL DATA

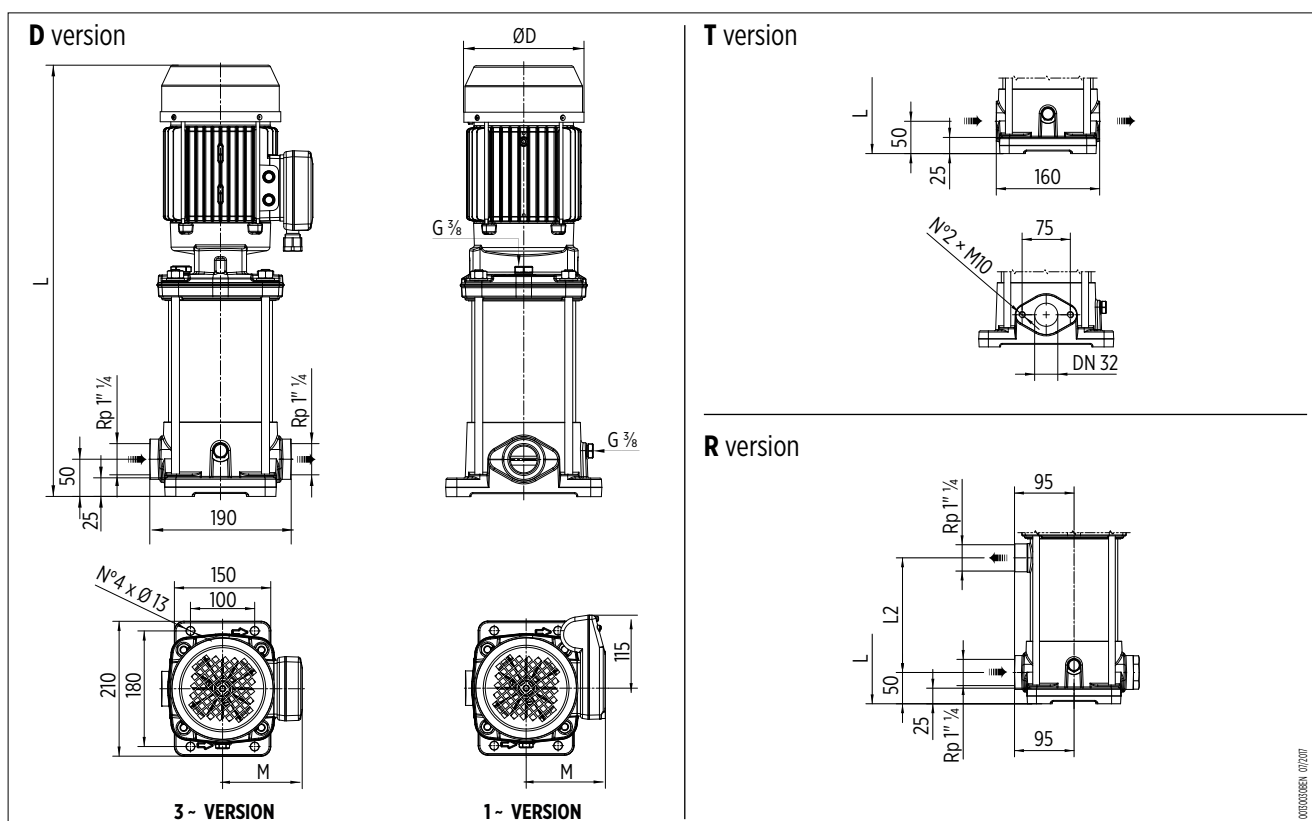
## SINGLE-PHASE VERSION

Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	Capacitor 450 V [µF]	INPUT CURRENT [A] 220-240 V	Dimensions [mm]				Weight [Kg]
		[kW]	[HP]				L	L2	ØD	M	
EM 3/2	71	0.33	0.45	0.5	16	2.5	441.5	87	144	117	19.4
EM 3/3	71	0.45	0.6	0.6	16	3.0	465.5	111	144	117	20.1
EM 3/4	71	0.55	0.75	0.8	16	3.7	489.5	135	144	117	20.7
EM 3/5	71	0.75	1	0.9	16	4.3	513.5	159	144	117	21.4
EM 3/6	71	0.9	1.2	1.1	30	5.4	537.5	183	144	117	22.5
EM 3/7	71	1.1	1.5	1.3	30	6.0	561.5	207	144	117	23.1
EM 3/8	80	1.3	1.8	1.4	30	6.9	627.5	231	162	124	27.2
EM 3/9	80	1.5	2	1.6	30	7.5	651.5	255	162	124	27.8

## THREE-PHASE VERSION

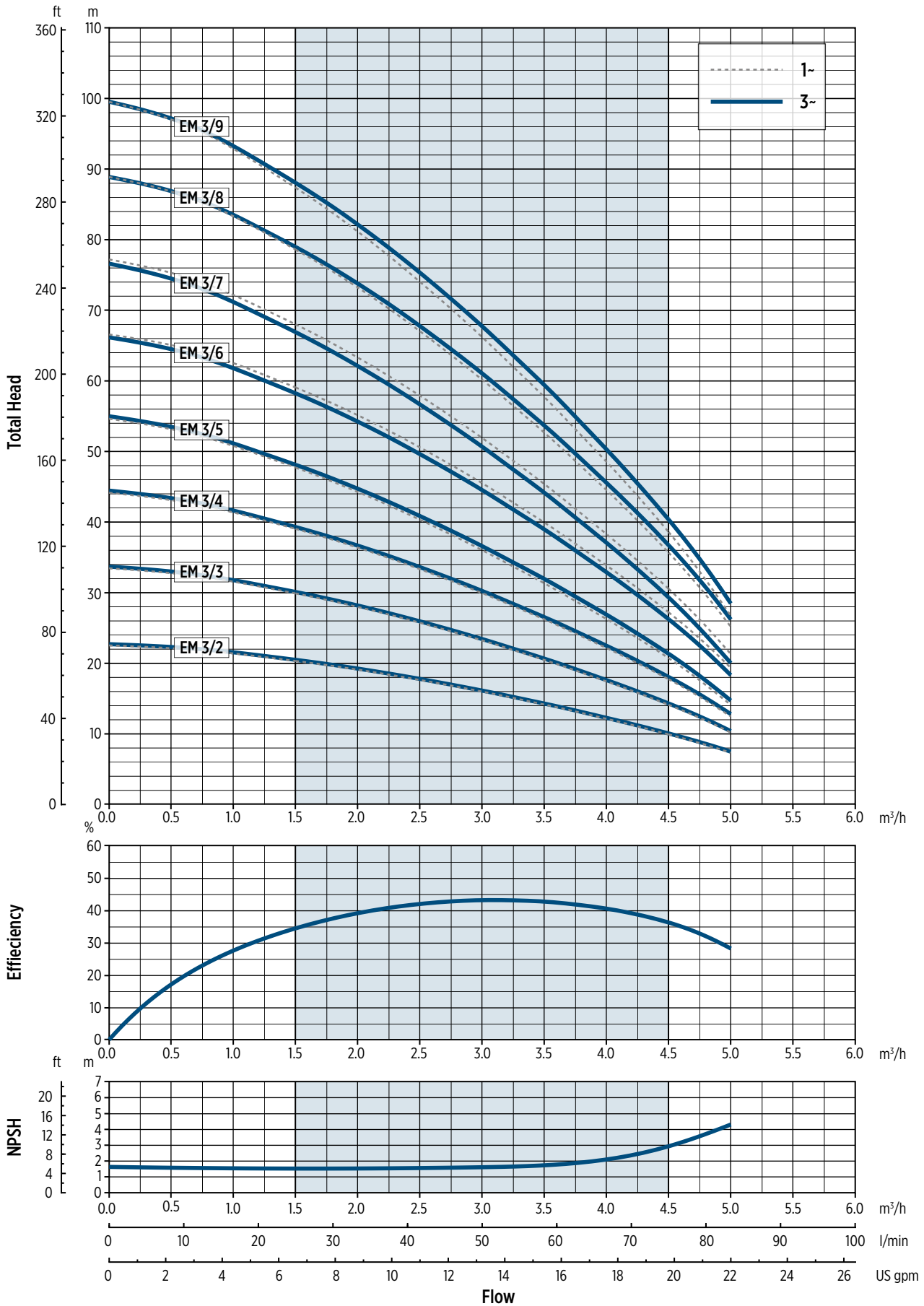
Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	INPUT CURRENT [A]		Dimensions [mm]				Weight [Kg]
		[kW]	[HP]		220-240 V	380-415 V	L	L2	ØD	M	
EM 3/2T	71	0.75	1	0.4	1.9	1.1	441.5	87	144	117	19.3
EM 3/3T	71	0.75	1	0.6	2.1	1.2	465.5	111	144	117	19.9
EM 3/4T	71	0.75	1	0.7	2.4	1.4	489.5	135	144	117	20.6
EM 3/5T	71	0.75	1	0.9	2.7	1.6	513.5	159	144	117	21.2
EM 3/6T	71	1.1	1.5	1.0	3.3	1.9	537.5	183	144	117	22.4
EM 3/7T	71	1.1	1.5	1.2	3.6	2.1	561.5	207	144	117	23
EM 3/8T	80	1.5	2	1.4	4.8	2.8	627.5	231	162	124	27
EM 3/9T	80	1.5	2	1.6	5.1	3.0	651.5	255	162	124	27.7

## DIMENSIONAL DRAWINGS



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# EM 3 - PERFORMANCE CURVES 50 HZ



# EM 5 - TECHNICAL DATA

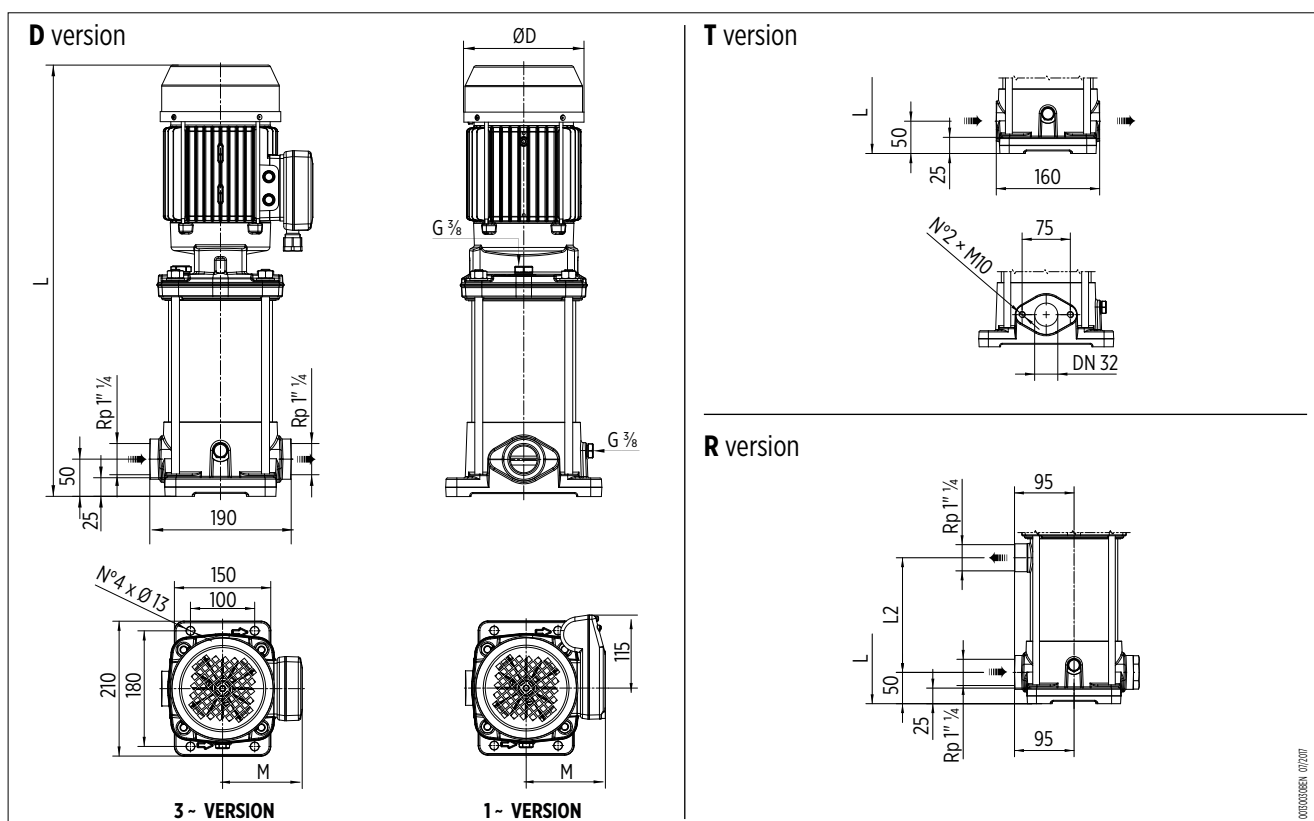
## SINGLE-PHASE VERSION

Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	Capacitor 450 V [µF]	INPUT CURRENT [A] 220-240 V	Dimensions [mm]				Weight [Kg]
		[kW]	[HP]				L	L2	ØD	M	
EM 5/2	71	0.45	0.6	0.6	16	3.0	441.5	87	144	117	19.4
EM 5/3	71	0.55	0.75	0.8	16	3.9	465.5	111	144	117	20.1
EM 5/4	71	0.9	1.2	1.1	30	5.3	489.5	135	144	117	21.2
EM 5/5	71	1.1	1.5	1.3	30	6.2	513.5	159	144	117	21.9
EM 5/6	80	1.3	1.8	1.5	30	7.3	579.5	183	162	124	25.9
EM 5/7	80	1.5	2	1.7	30	8.2	603.5	207	162	124	26.6
EM 5/8	90	1.85	2.5	2.4	60	10.4	666.5	231	179	131	32.6
EM 5/9	90	2.2	3	2.6	60	11.4	690.5	255	179	131	33.2

## THREE-PHASE VERSION

Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	INPUT CURRENT [A]		Dimensions [mm]				Weight [Kg]
		[kW]	[HP]		220-240 V	380-415 V	L	L2	ØD	M	
EM 5/2T	71	0.75	1	0.6	2.1	1.2	441.5	87	144	117	19.3
EM 5/3T	71	0.75	1	0.8	2.5	1.4	465.5	111	144	117	19.9
EM 5/4T	71	1.1	1.5	1.0	3.2	1.9	489.5	135	144	117	21.1
EM 5/5T	71	1.1	1.5	1.2	3.7	2.2	513.5	159	144	117	21.7
EM 5/6T	80	1.5	2	1.5	5.0	2.9	579.5	183	162	124	25.8
EM 5/7T	80	1.5	2	1.7	5.5	3.2	603.5	207	162	124	26.4
EM 5/8T	90	2.2	3	2.1	6.8	3.9	666.5	231	179	131	32.5
EM 5/9T	90	2.2	3	2.3	7.4	4.3	690.5	255	179	131	33.1

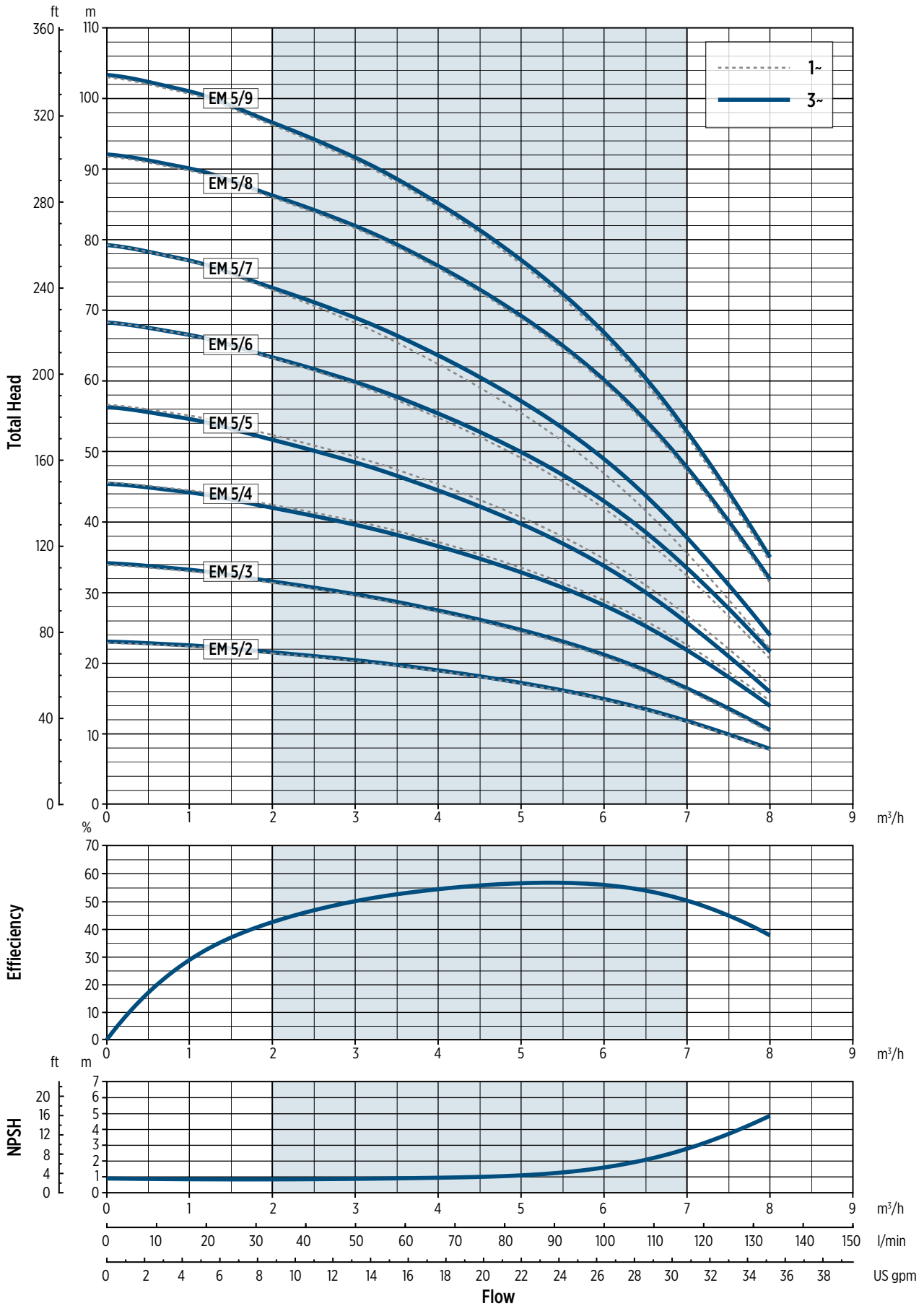
## DIMENSIONAL DRAWINGS



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# EM 5 - PERFORMANCE CURVES 50 HZ



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# EM 9 - TECHNICAL DATA

## SINGLE-PHASE VERSION

Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	Capacitor 450 V [µF]	INPUT CURRENT [A] 220-240 V	Dimensions [mm]				Weight [Kg]
		[kW]	[HP]				L	L2	ØD	M	
EM 9/2	71	0.75	1	0.9	16	4.3	483.5	99	144	117	23
EM 9/3	71	1.1	1.5	1.4	30	6.3	513.5	129	144	117	24.3
EM 9/4	80	1.5	2	1.7	30	8.2	585.5	159	162	124	28.5
EM 9/5	90	2.2	3	2.5	60	11.1	654.5	189	179	131	34.6
EM 9/6	90	2.2	3	2.9	60	12.7	684.5	219	179	131	35.4

## THREE-PHASE VERSION

Pump model	Motor Size	MOTOR NOMINAL POWER		INPUT POWER [kW]	INPUT CURRENT [A]		Dimensions [mm]				Weight [Kg]
		[kW]	[HP]		220-240 V	380-415 V	L	L2	ØD	M	
EM 9/2T	71	0.75	1	0.9	2.7	1.6	483.5	99	144	117	22.8
EM 9/3T	71	1.1	1.5	1.2	3.8	2.2	513.5	129	144	117	24.1
EM 9/4T	80	1.5	2	1.7	5.5	3.2	585.5	159	162	124	28.3
EM 9/5T	90	2.2	3	2.2	7.1	4.1	654.5	189	179	131	34.5
EM 9/6T	90	2.2	3	2.6	8.2	4.7	684.5	219	179	131	35.3
EM 9/7T	90	3	4	3.1	9.5	5.5	752.5	249	179	131	39.2
EM 9/8T	90	3	4	3.5	10.4	6.0	782.5	279	179	131	40

## DIMENSIONAL DRAWINGS

**D version**

**3 - VERSION**                      **1 - VERSION**

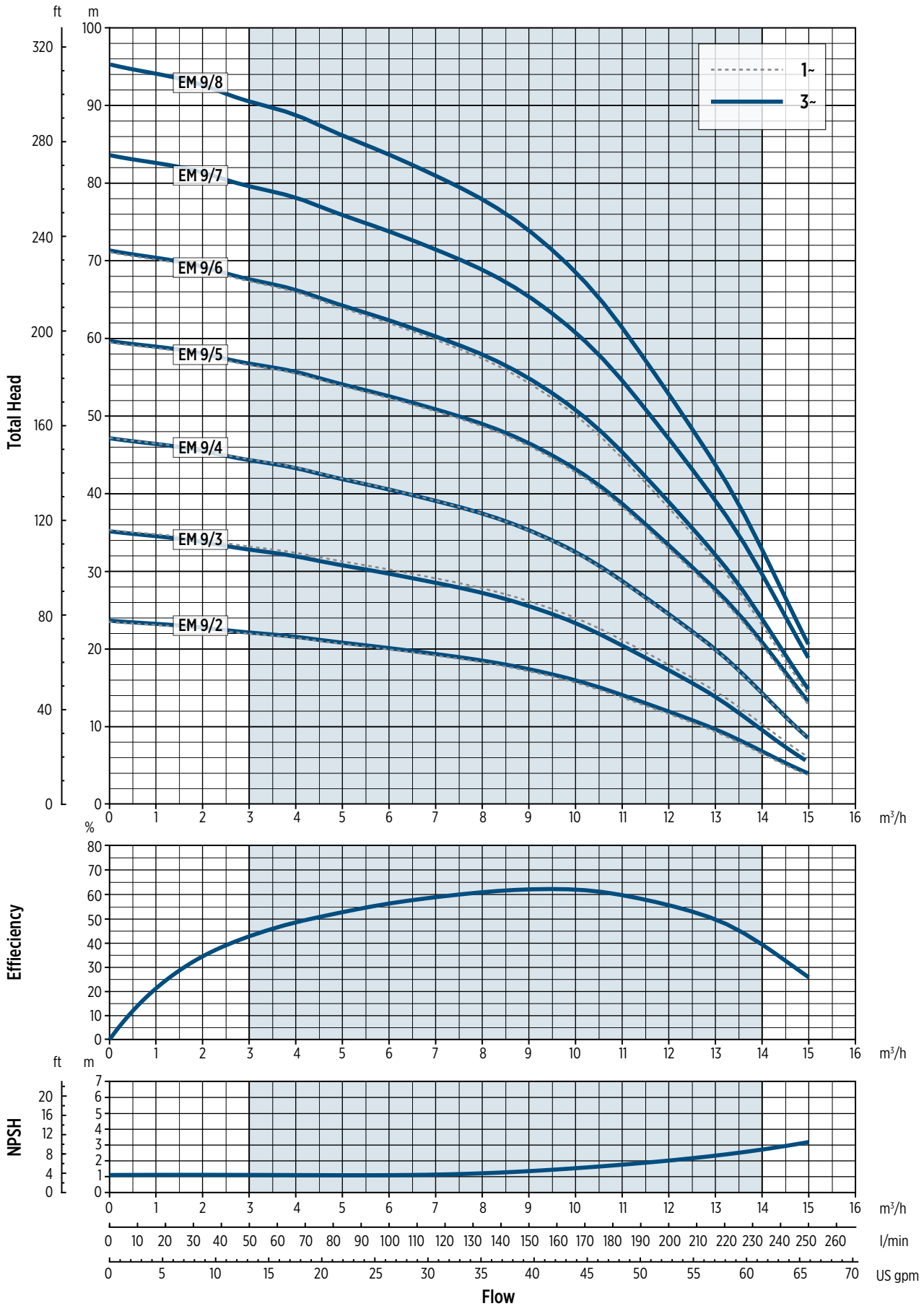
**T version**

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**R version**

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# EM 9 - PERFORMANCE CURVES 50 HZ



0012007EN.03/2020

## CATALOG REVISION CHANGE NOTICE

Rev. No.	Changes	Page
01	Updating "Family curves" graph	3
	Updating "Table of Hydraulic Performance at 50 Hz"	5
	Changed the technical data of EM 5/8 1~ on table "1 - ELECTRIC PUMP technical data"	12
02	Modification of "List of main components" and "Parts in contact with fluids"	4, 18 (REV.01)
	Added section "Spare parts and material"	4
	Added section "Motor spare parts"	9
03	Modification of "Spare parts and material"	4
	Updating "Hydraulic performance at 50 Hz"	5, 6
	Updating of "Motor spare parts" list	9
04	Removed "EM 9/7" single-phase model	5, 16, 17









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