智慧箱泵集成供水行业引领者

铭星供水设备
MINGXING WATER SUPPLY

乐水智慧水务
LESHUI SMART WATER

LIFE PUMP
PRODUCT SELECTION

MS/MC
Vertical Multi-Stage Stainless Steel Pump
50Hz

Jiangsu Mingxing water supply equipment Co., Ltd

Address: No. 1, Mingxing North Road, Tech Inovation Park,Jianhu,Yancheng City,Jiangsu,China
Tel:+86-5158066333
Fax:+86-515 8627222
Zip:224700
Email:mingxingwatersupply@gmail.com

Scan and learn more

Mar. 2024 Edition

CONTENTS
目录

MX铭星
JIANGSU MINGXING WATER SUPPLY EQUIPMENT CO.,LTD

Brief Introduction

Company profile

Jiangsu Mingxing Water Supply Equipment Co., Ltd. is a collection of design, research and development, production, sales, installation, serviceThe national high-tech enterprise that works in one provides full-stack "wisdom supply" based on the Internet of Things and big data Water "solutions. In 2016, we founded the Leshui Smart water brand, focusing on the depth of secondary water supply technologyR&d and innovation. The company has branches in Shanghai, Anhui, Sichuan and other regions, and set up direct sales in many placesOffice, focus on providing you with a safe life, fire water supply equipment!

Product-oriented, We has established long-term industry-university-research cooperation with key national research institutes has a provincial R & D platform, with invention patents, utility model patents, Copyrights and other intellectual property rights ten items, SW water tank, box pump integration without floating pump station and other products were rated as provincial high-tech products and Provincial new product and new technology appraisal. The selection and safety of prefabricated box pump integrated fire water supply pump station are edited installation -- MX Intelligent Pump Station 18CS01, Technical regulations of assembled box pump integrated fire water supply pump station CEC S 6 2 3-2 0 1 9, participated in the compilation of "Variable Frequency and speed regulation water Supply equipment selection and installation"16S111, "Sewage lifting device application Technical regulations" CECS463-2017, "water consumption gauge practical atlas, standards and technical documents. Leshui Smart Water focuses on the research and development of domestic water supply equipment, production and sales, into the world's cutting-edge technology field, the core business includes industrial iot concept as the goal, Carry out research and development, production, sales and service of smart iot for water systems, and use smart management platform for water systems ,The design, application and maintenance of the system is an opportunity to develop the safety, energy saving and efficient operation of the water system channel, integration of water system innovative products and solutions, to provide customers with a strong service guarantee, build for customers households create a value platform to promote the realization of the value chain of water enterprises with a win-win business model for customers households create greater value.

Since its establishment in 2006, the company has unswervingly adhered to product innovation, in government departments,Hospitals, education and other fields have a broad customer base, sales performance is stable, increasing year by year,The company has passed ISO9001 quality management system and

ISO14000 environmental management system OHSAS occupational health and safety system three major certification, fire products through the 3C compulsory certification, the establishment of perfect quality assurance system, and was rated as "AAA "credit firm in Jiangsu Province.

中国节能认证

新华节水认证

国家火炬计划
重点高新技术企业

环境管理体系认证

中国环保产品认证

十二星级售后服务认证

职业健康安全管理体系认证

质量管理体系认证

Pump Introduction

MS, MC is a high-efficiency and energy-saving vertical multi-stage centrifugal pump, through the centrifugal force generated by the impeller of the rotating pump to drive the rotation of the fluid to complete the transfer of the liquid body, mainly by the main shaft, impeller, guide vane, pump shell, mechanical sealing combination of the pump body and the motor connection.

MS, MC series as a booster pump can be used alone, or can be equipped with booster equipment used in building and industrial booster system, its pipeline structure can ensure that the pump directly installed in the same horizontal line and pipe diameter of the same horizontal pipeline system, this design makes the pump structure and pipeline more compact.

MS, MC series vertical multistage centrifugal pumps can be installed vertically or horizontally on the pipeline according to the different installation space on site. In the case of horizontal installation, the pump needs to add a fixed block to ensure the smoothness of the pump during operation.

Pump connection mode

- Flange connection
- Threaded connection
- Clamp connection
- Oval flange connection

Pump material

- Cast iron
- Stainless steel (AISI304,AISI316)
- Duplex stainless steel (2205)

Motor

- Squirrel cage fully enclosed air-cooled IEC motor, suitable for continuous operation
- Protection grade: IP55
- Insulation class: F
- Standard voltage: 3x220-240/380-415V 1x220-240V
- Single-phase motors are available from 0.37kW-2.2kW.

Pump liquid temperature

- Normal temperature pump: liquid temperature -15 ℃ to +70 ℃
- Hot water pump: liquid temperature -15 ℃ to +105 ℃

Performance curve

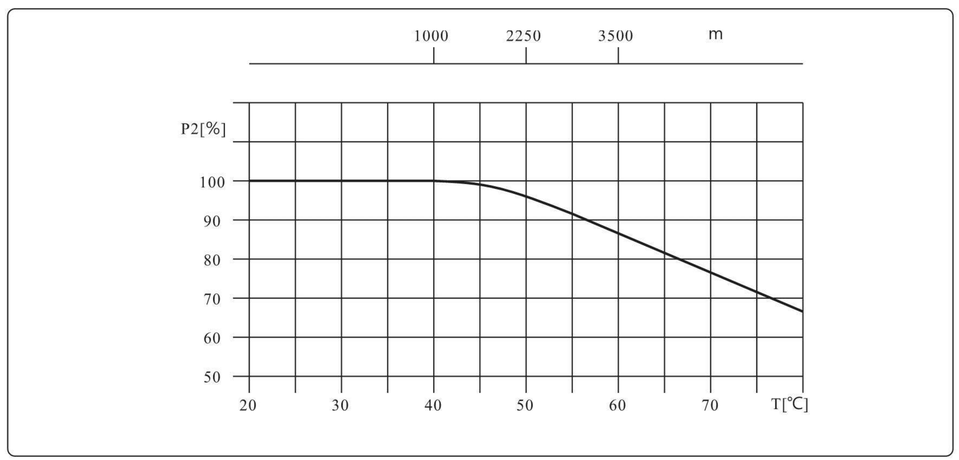
- All curves are based on motor measurements at a constant speed of 2900rpm or 2950rpm.
- Curve tolerance in line with ISO9906.
- Test using 20℃ water without air, kinematic viscosity 1mm² /s.
- The use of the pump refers to the performance range of the thick line to prevent the flow rate from overheating or excessive flow ambassador motor overload.

Pump operating condition

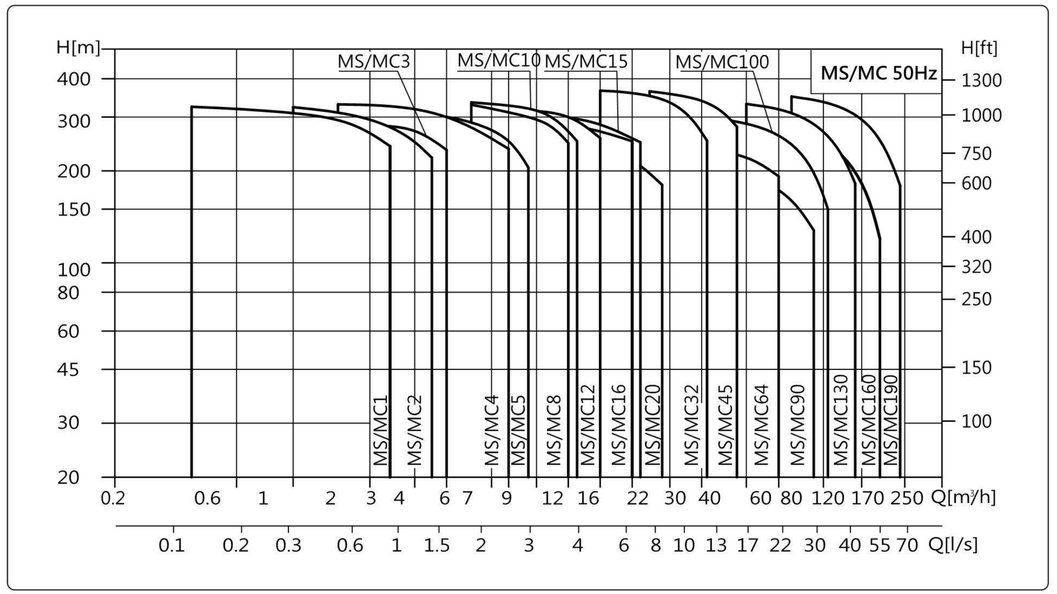
- Thin, clean, non-flammable and non-flammable liquid containing no particles or fibers (details can be found in the liquid delivery instructions at the end of the sample)
- Ambient temperature: no more than +40 ℃
- Altitude: no more than 1000m

Altitude and ambient temperature

When the pump is operating at an ambient temperature greater than 40 ° C or an altitude greater than 1000m, the motor output power P2 will be reduced, and the pump in the above cases, the motor power needs to be configured large.



Performance Range

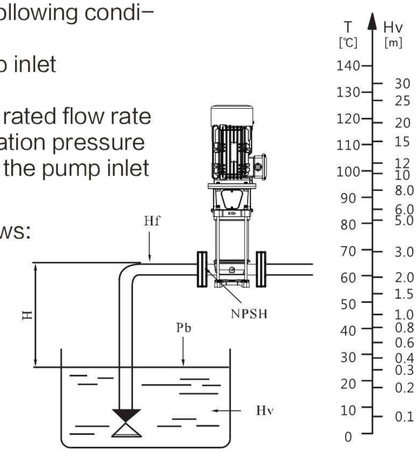


Minimum inlet pressure NPSH

Cavitation may occur if the pump is under any of the following conditions during operation:

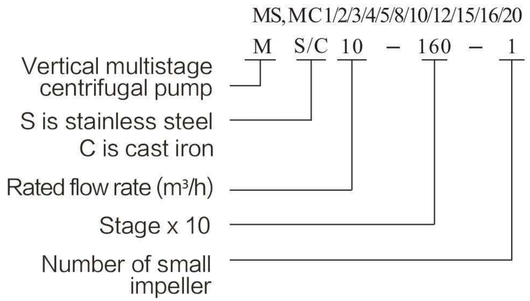
- The water tank or pool is lower than the water pump inlet
- Liquid temperature is too high
- The actual flow rate is significantly greater than the rated flow rate
- The pressure in the pump is lower than the vaporization pressure of the conveying liquid to avoid cavitation, ensure that the pump inlet side has a minimum pressure.

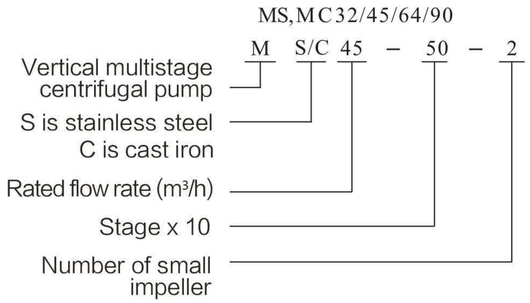
The maximum suction H[m] can be calculated as follows:
H = Pb ×10 .2 -NPSH-Hf-Hv -Hs
Pb= atmospheric pressure [bar]
(atmospheric pressure can be set to 1bar)
In a closed system, Pb is the system pressure [bar]
NPSH= Net positive suction head
(can be read from the maximum possible flow of the pump on the NPSH curve)
Hf= Line loss at inlet [m]
Hv= Vaporization pressure [m]
Hs= Safety margin = Minimum 0.5m head
If the calculated H is positive, the pump can operate at maximum suction H. If H is negative, there

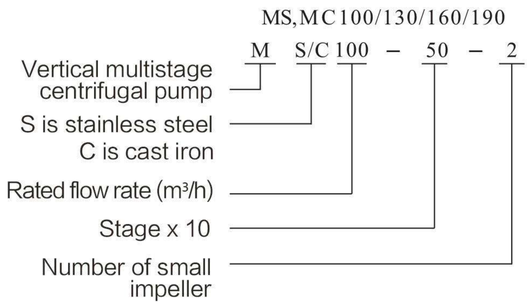


Check to make sure the pump is not/is not in a cavitation state

Model Description







Typical application

Water supply

- Water plant filtration and transportation
- Water plant area water supply
- Main pipesupercharging
- High-rise building
- Pressurization of hotels, etc
- Industrial water pressurization

Industrial Boosting

- Process water system
- Cleaning system
- High pressure flushing system
- Fire protection system
- Automotive cleaning equipment industrial liquid transport

Industrial liquid transportation

- Cooling air conditioning system
- Boiler feed water
- Condensing system and cooling tower
- Machine cooling and lubrication

Transfer

- Oil and alcohol
- Acids and Alkali
- Glycol and coolant

Water treatment

- Ultrafiltration system
- Reverse osmosis system
- Distillation system
- Separator
- Swimming pool

Irrigation

- Regional irrigation
- Sprinkler irrigation
- Drip irrigation
- Greenhouse

Max Operation Pressure

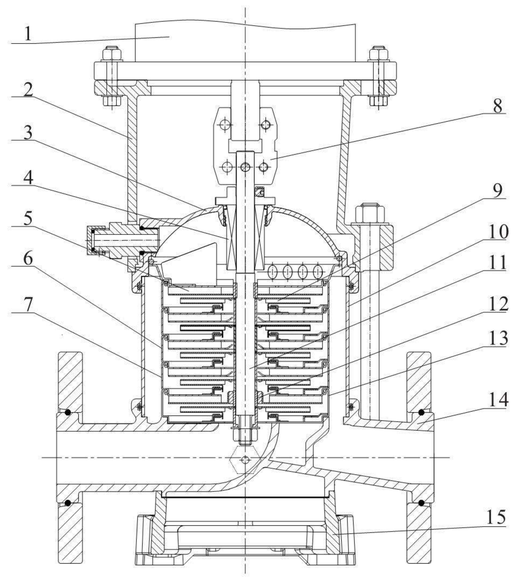
Model \ Connection	Flange connection、Threaded connection、Clamp connection	Oval flange connection
	Maximum allowable operating pressure (bar)	Maximum allowable operating pressure (bar)
MS,MC1	33	16
MS,MC2	33	16
MS,MC3	30	16
MS,MC4	33	16
MS,MC5	32	16
MS,MC8	33	16
MS,MC10	34	16
MS,MC12	32	16
MS,MC15	31	16
MS,MC16	29	16
MS,MC20	25	16
MS,MC32-10-1 ~ 32-70	16	/
MS,MC32-80-2 ~ 32-120	26	/
MS,MC32-160-2 ~ 32-170	37	/
MS,MC45-10-1 ~ 45-60	16	/
MS,MC45-70-2 ~ 45-90	24	/
MS,MC45-100-2 ~ 45-140-2	37	/
MS,MC64-10-1 ~ 64-50	15	/
MS,MC64-60-2 ~ 64-80	25	/
MS,MC90-10-1 ~ 90-50-2	15	/
MS,MC90-50 ~ 90-70-2	22	/
MS,MC100	31	/
MS,MC130	34	/
MS,MC160	28	/
MS,MC190	36	/

Product Overview

Main parameter	MS/MC1	MS/MC2	MS/MC3	MS/MC4	MS/MC5	MS/MC8	MS/MC10	MS/MC12	MS/MC15	MS/MC16	MS/MC20
Rated flow rate [m³/h]	1	2	3	4	5	8	10	12	15	16	20
Rated flow rate [1/s]	0. 28	0.56	0. 83	1.1	1.39	2.2	2. 78	3.3	4. 17	4.4	5.6
Flow ange [m³/h]	0. 4~2.4	1~3.5	1.2~4	1.5~6	2. 5~8. 5	5~12	5~13	7~16	8~23	8~22	10 ~28
Flow ange [1/s]	0.11 ~0.66	0.28~0.97	0. 33~1.1	0.42~1.63	0.69~2.36	1.39~3.3	1.39~3.61	1.9~4.4	2.22~6.39	2.2~6.1	2.8~7.8
Maximum pressure [bar]	33	33	30	33	32	33	34	32	31	29	25
Motor power [kW]	0. 37~3	0.37~5.5	0. 37~5.5	0. 55~7.5	0.37~7. 5	0.75~15	0.75~15	1.5~18.5	1. 1~22	2.2~22	1.1~22
Temperature range [° C]	-15~105										
Maximum efficiency [%]	48	52	57	57	66	62	68	63	68	66	68
Ms pipe connection											
DIN Flange	DN25	DN25	DN25	DN32	DN32	DN40	DN40	DN50	DN50	DN50	DN50
Pipe thread	R1 1¼''	R1 1¼''	R1 1¼''	R1 1¼''	R1 1¼''	R2''	R2''	R2''	R2''	R2''	R2''
Clamp joint	DN32	DN32	DN32	DN32	DN32	DN50	DN50	DN50	DN50	DN50	DN50
Mc pipe connection											
DIN Flange	DN25	DN25	DN25	DN32	DN32	DN40	DN40	DN50	DN50	DN50	DN50
Oval flange	Rp1	Rp1	Rp1	Rp1 1¼	Rp1 1¼	Rp1 1½	Rp1 1½	Rp1 1½	Rp1 1½	Rp1 1½	Rp1 1½

主要参数	MS/MC32	MS/MC45	MS/MC64	MS/MC90	MS/MC100	MS/MC130	MS/MC160	MS/MC190
Rated flow rate [m³/h]	32	45	64	90	100	130	160	190
Rated flow rate [1/s]	8.9	12.5	17.8	25	27. 78	36. 11	44.44	52. 78
Flow ange [m³/h]	16 ~42	25 ~55	30 ~80	50 ~110	50 ~125	60 ~160	80~200	90 ~240
Flow ange [1/s]	4. 4~11	6. 9~15.3	8~22	14 ~30	14~34. 7	16. 7~44. 4	22. 2~55.6	25~66. 7
Maximum pressure [bar]	37	37	25	22	31	34	28	36
Motor power [kW]	2. 2~45	4~55	4~55	7.5~55	5. 5~75	11 ~110	11 ~110	18. 5~200
Temperature range [° C]	-15~105							
Maximum efficiency [%]	75	75	75	76	79	80	80	80
Pipe connection								
DIN Flange	DN65	DN80	DN100	DN100	DN100	DN150	DN150	DN200

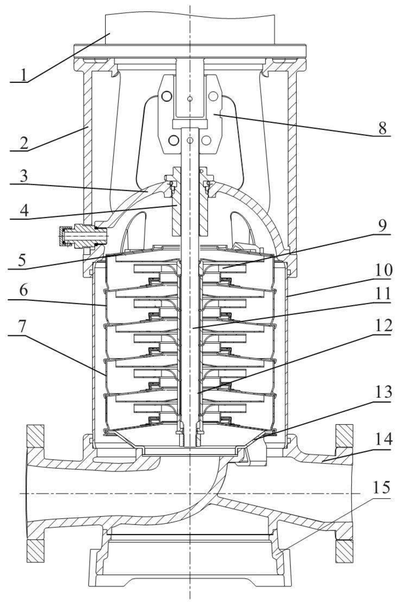
Structure DiagramMS/MC1,2,3,4,5



Material MS/MC1,2,3,4,5

S/N	Components	Material		GB		EN DIN		AISI/ASTM	
		MC	MS	MC	MS	MC	MS	MC	MS
1	Motor	/		/		/		/	
2	Bracket	Cast iron/ductile		GB 9439-HT200/GB 1348-QT500-7		EN 1561 EN-GJL-200/ EN 1563 EN-GJS-500-7		ASTM25B/ ASTMA536 65-45-12	
3	Sealing seat	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
4	Mechanical	/		/		/		/	
5	Outlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
6	Diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
7	Support diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
8	Coupling	Nodular cast		GB 1348-QT500-7		EN 1563 EN-GJS-500-7		ASTM A536 65-45-12	
9	Impeller	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
10	Cylinder	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
11	Shaft	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
12	Bearing	Tungsten carbide		/		/		/	
13	Inlet diffuser			GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
14	Casing	Cast iron/Steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
15	Base	Cast iron		GB 9439-HT200		EN 1561 EN-GJL-200		ASTM25B	

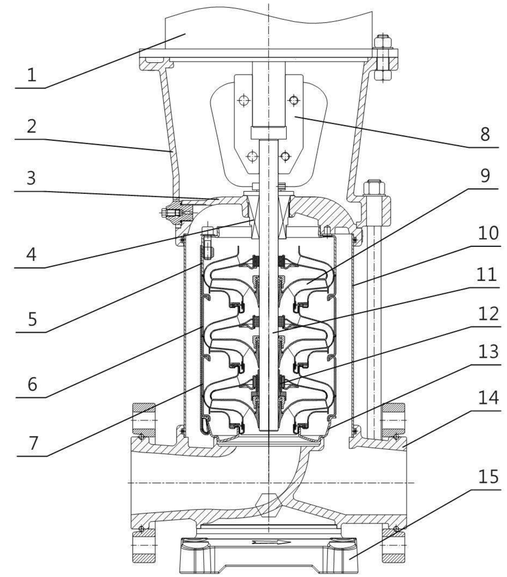
Structure Diagram MS/MC8,10,12,15,16,20



Material MS/MC8,10,12,15,16,20

S/N	Components	Material		GB		EN DIN		AISI/ASTM	
		MC	MS	MC	MS	MC	MS	MC	MS
1	Motor	/		/		/		/	
2	Bracket	Cast iron/ductile iron		GB 9439-HT200/GB 1348-QT500-7		EN 1561 EN-GJL-200/ EN 1563 EN-GJS-500-7		ASTM25B/ ASTMA536 65-45-12	
3	Sealing seat	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
4	Mechanical seal	/		/		/		/	
5	Outlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
6	Diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
7	Support diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
8	Coupling	Nodular cast iron		GB 1348-QT500-7		EN 1563 EN-GJS-500-7		ASTM A536 65-45-12	
9	Impeller	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
10	Cylinder	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
11	Shaft	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
12	Bearing	Tungsten carbide		/		/		/	
13	Inlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
14	Casing	Cast iron/ Steel stainless		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
15	Base	Cast iron		GB 9439-HT200		EN 1561 EN-GJL-200		ASTM25B	

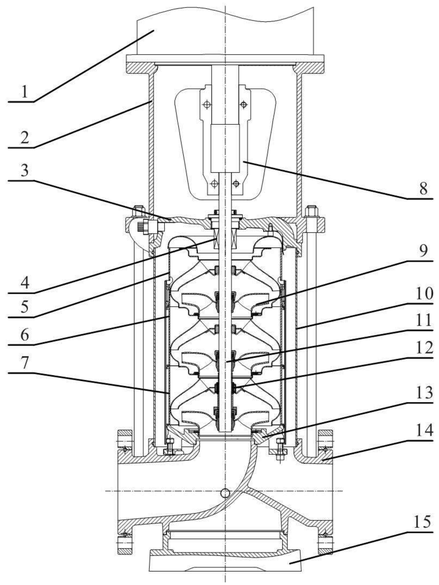
Structure Diagram MS/MC32,45,64,90



Material MS/MC32,45,64,90

S/N	Components	Material		GB		EN DIN		AISI/ASTM	
		MC	MS	MC	MS	MC	MS	MC	MS
1	Motor	/		/		/		/	
2	Bracket	Cast iron/ductile iron		GB 9439-HT200/GB 1348-QT500-7		EN 1561 EN-GJL-200/ EN 1563 EN-GJS-500-7		ASTM25B/ ASTMA536 65-45-12	
3	Sealing seat	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
4	Mechanical seal	/		/		/		/	
5	Outlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
6	Diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
7	Support diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
8	Coupling	Nodular cast iron		GB 1348-QT500-7		EN 1563 EN-GJS-500-7		ASTM A536 65-45-12	
9	Impeller	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
10	Cylinder	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
11	Shaft	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
12	Bearing	Tungsten carbide		/		/		/	
13	Inlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
14	Casing	Cast iron/ Steel stainless		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
15	Base	Cast iron		GB 9439-HT200		EN 1561 EN-GJL-200		ASTM25B	

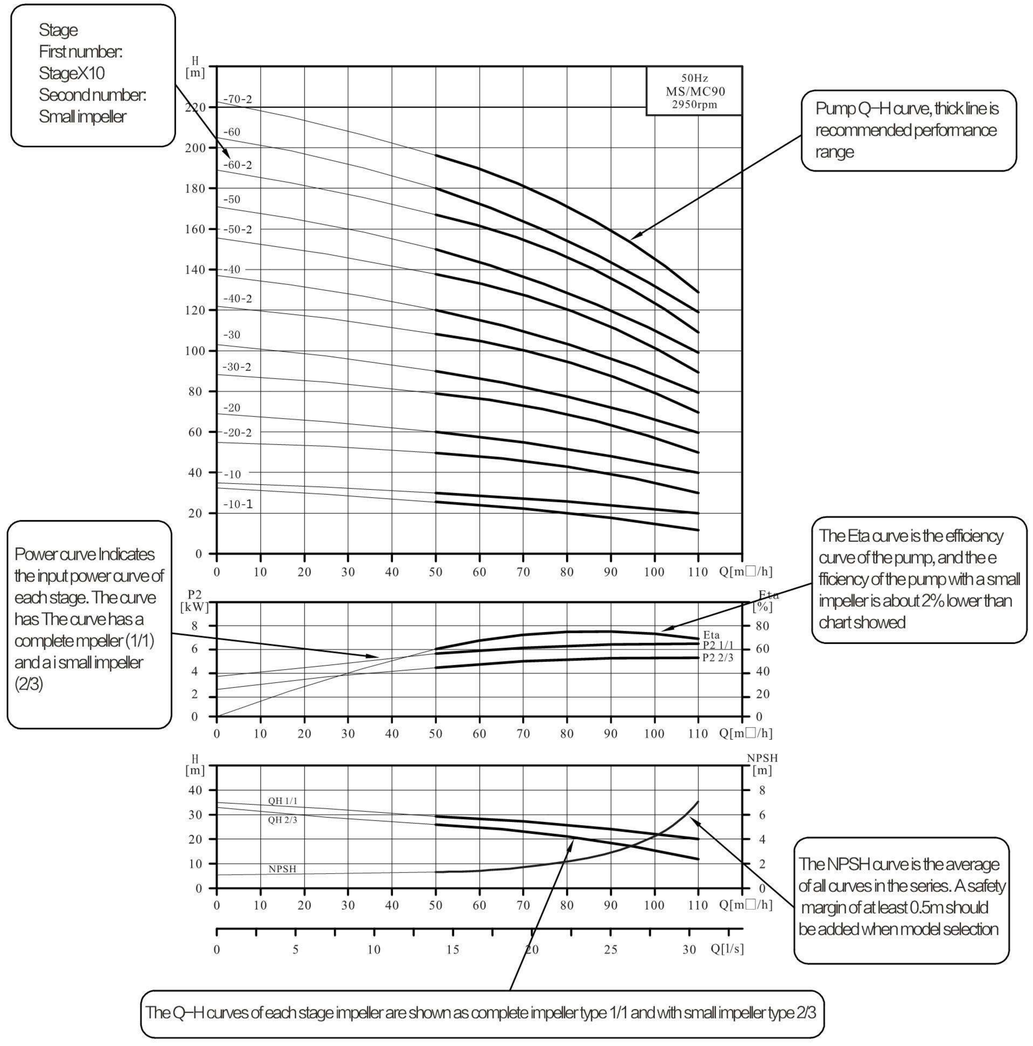
Structure Diagram MS/MC100,130,160,190



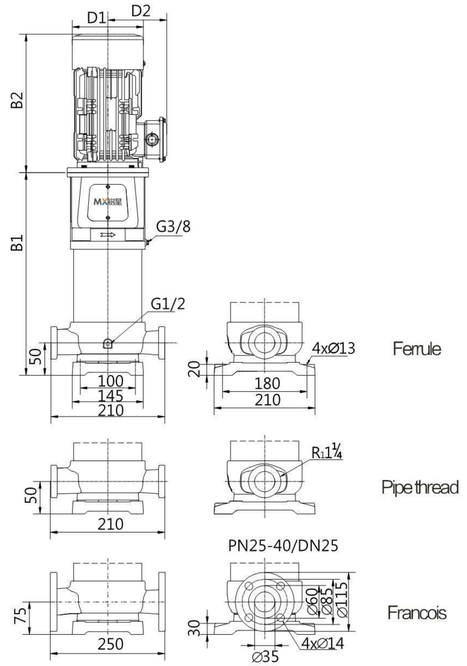
Material MS/MC100,130,160,190

S/N	Components	Material		GB		EN DIN		AISI/ASTM	
		MC	MS	MC	MS	MC	MS	MC	MS
1	Motor	/		/		/		/	
2	Bracket	Cast iron/ductile iron		GB 9439-HT200/ GB 1348-QT500-7		EN 1561 EN-GJL-200/ EN 1563 EN-GJS-500-7		ASTM25B/ ASTMA536 65-45-12	
3	Sealing seat	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
4	Mechanical seal	/		/		/		/	
5	Outlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
6	Diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
7	Support diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
8	Coupling	球墨铸铁		GB 1348-QT500-7		EN 1563 EN-GJS-500-7		ASTM A536 65-45-12	
9	Impeller	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
10	Cylinder	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
11	Shaft	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
12	Bearing	碳化钨		/		/		/	
13	Inlet diffuser	Stainless steel		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
14	Casing	Cast iron/ Steel stainless		GB/T20878-06Cr19Ni10		EN 10088-1.4301		AISI304	
15	Base	Nodular cast iron		GB 1348-QT500-7		EN 1563 EN-GJS-500-7		ASTM A536 65-45-12	

Description of reading performance curves



Mounting dimensions and weight

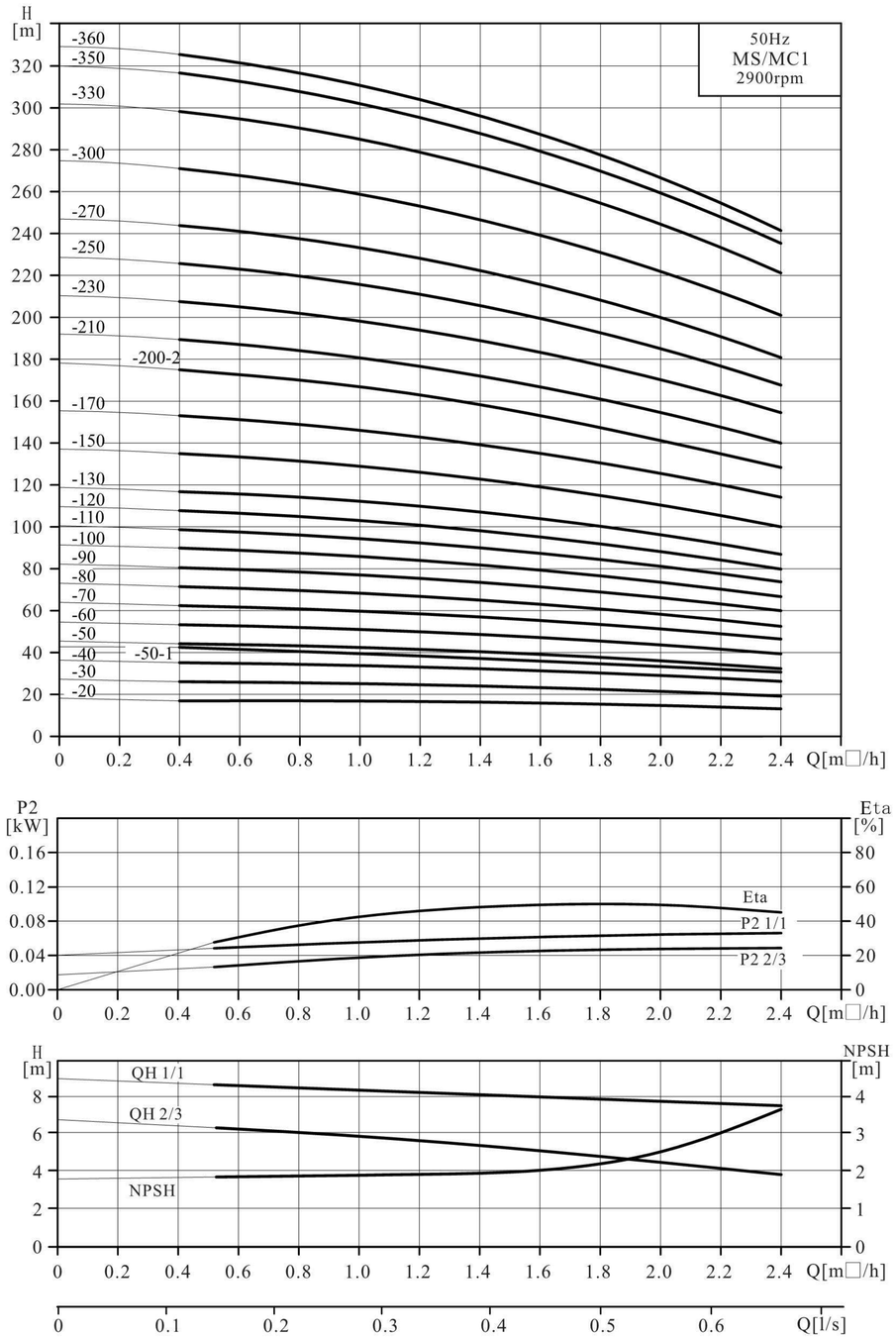


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS1-20	262	240	502	148	117	23
MS1-30	280	240	520	148	117	23
MS1-40	298	240	538	148	117	24
MS1-50-1	316	240	556	148	117	25
MS1-50	316	240	556	148	117	25
MS1-60	334	240	574	148	117	26
MS1-70	352	240	592	148	117	27
MS1-80	370	280	650	170	142	36
MS1-90	398	280	678	170	142	37
MS1-100	416	280	696	170	142	38
MS1-110	434	280	714	170	142	40
MS1-120	452	280	732	170	142	41
MS1-130	470	280	750	170	142	42
MS1-150	506	280	786	170	142	43
MS1-170	542	350	892	190	155	51
MS1-200-2	606	350	956	190	155	53
MS1-210	624	350	974	190	155	58
MS1-230	660	350	1010	190	155	59
MS1-250	696	350	1046	190	155	61
MS1-270	732	350	1082	190	155	62
MS1-300	786	350	1136	190	155	64
MS1-330	840	410	1250	196	165	73
MS1-350	876	410	1286	196	165	74
MS1-360	904	410	1314	196	165	75

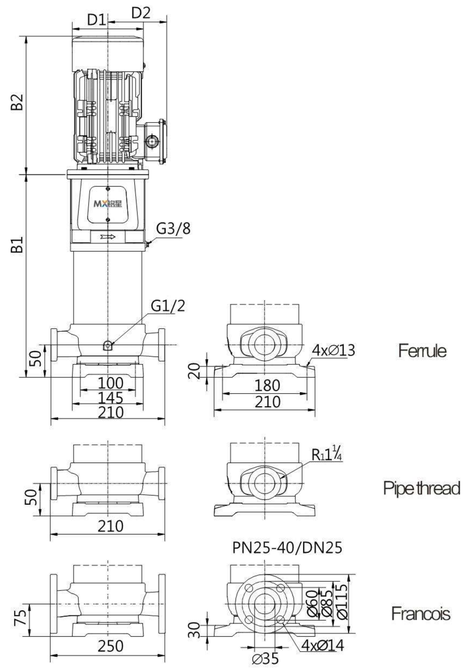
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2	2.2	2.4
MS1-20	0.37	H (m)	18	17.7	17.4	17	16.8	16.5	16	15.5	15	14	13
MS1-30	0.37		27	26.7	26.4	26	25	24.5	24	23	22	21	20
MS1-40	0.37		36	35.5	35	34	33.5	33	32	31	30	28	27
MS1-50-1	0.37		43	42	41	39.5	39	38	37	36	34	33	31
MS1-50	0.55		45	44.5	44	43	42	41	40	38.5	37	35	33.5
MS1-60	0.55		54	53.5	53	51	50	49	48	46	44	42	40
MS1-70	0.55		63	62.5	61.5	60	59	58	56	54	52	50	47
MS1-80	0.75		72	71.5	70	69	67	66	64	62	59	57	54
MS1-90	0.75		81	80	79	77	76	74	72	69	67	64	60
MS1-100	0.75		90	89	88	86	84	82	80	77	74	71	67
MS1-110	1.1		99	98	97	94	93	90	88	85	81	78	74
MS1-120	1.1		108	107	105	103	101	99	96	93	89	85	80
MS1-130	1.1		117	116	114	111	110	107	104	100	96	92	87
MS1-150	1.1		135	134	132	129	126	123	120	116	111	106	100
MS1-170	1.5		153	151.5	150	146	143	140	135	131	126	120	114
MS1-200-2	1.5		175	173	170	167	163	158	153	148	142	136	128
MS1-210	2.2		189	187.5	185	180	177	173	167	162	155	149	141
MS1-230	2.2		207	205	202	197	194	189	183	177	170	163	154
MS1-250	2.2		225	223	220	214	211	206	199	193	185	177	167
MS1-270	2.2		243	241	238	231	227	222	215	208	200	191	181
MS1-300	2.2		270	268	264	257	253	247	239	231	222	212	201
MS1-330	3		297	295	290	283	278	271	263	255	244	234	221
MS1-350	3		315	312	308	300	295	288	279	270	259	248	234
MS1-360	3		324	321	317	309	303	296	287	278	266	255	241

Performance curve



Mounting dimensions and weight



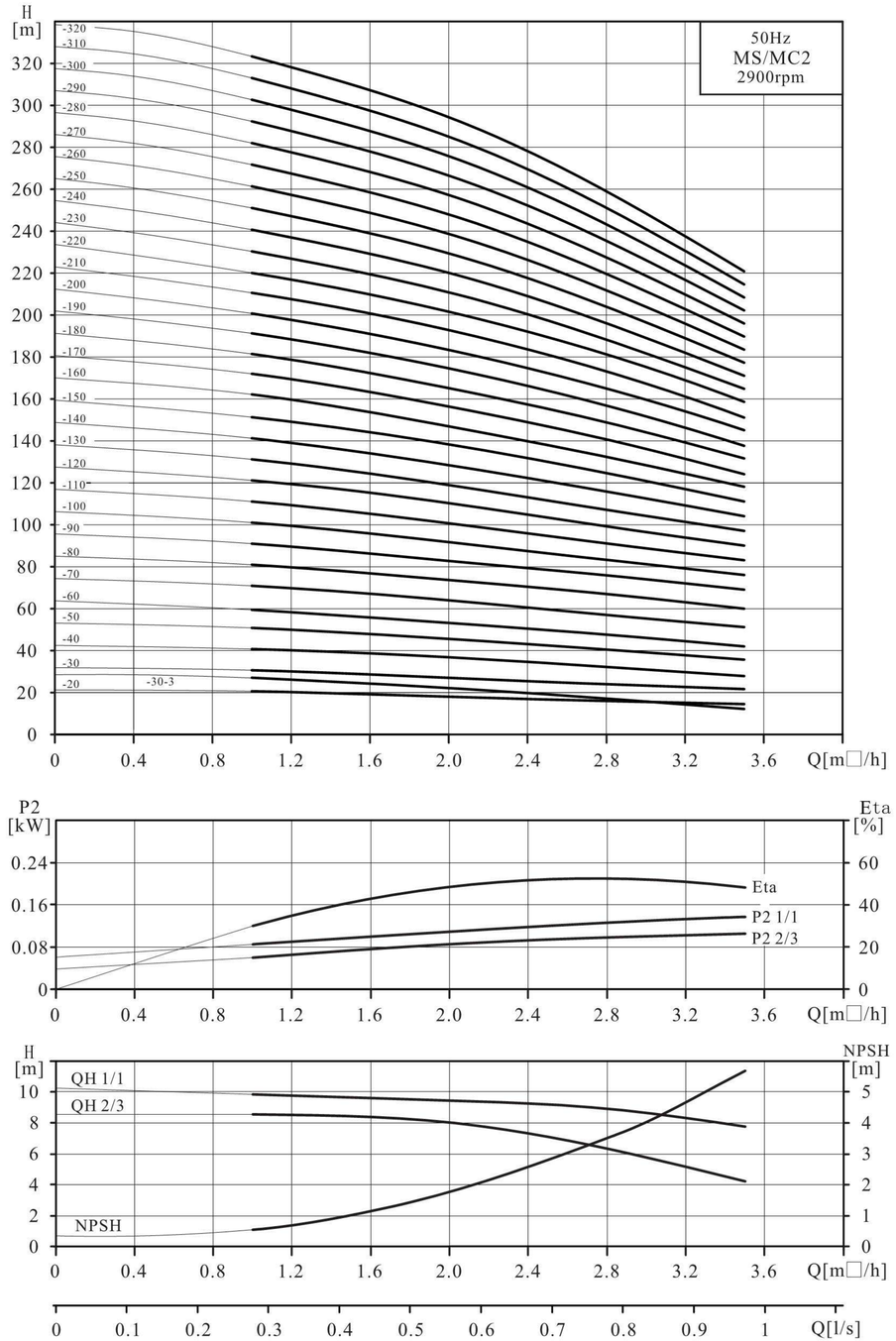
Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS2-20	262	240	502	148	117	23
MS2-30-3	280	240	520	148	117	23
MS2-30	280	240	520	148	117	25
MS2-40	298	240	538	148	117	25
MS2-50	326	280	606	170	142	35
MS2-60	344	280	624	170	142	35
MS2-70	362	280	642	170	142	38
MS2-80	380	280	660	170	142	39
MS2-90	398	280	678	170	142	39
MS2-100	426	350	776	190	155	47
MS2-110	444	350	794	190	155	47
MS2-120	462	350	812	190	155	48
MS2-130	480	350	830	190	155	53
MS2-140	498	350	848	190	155	53
MS2-150	516	350	866	190	155	54
MS2-160	534	350	884	190	155	55
MS2-170	552	350	902	190	155	55
MS2-180	570	350	920	190	155	56
MS2-190	598	410	1008	196	165	63
MS2-200	616	410	1026	196	165	64
MS2-210	634	410	1044	196	165	65
MS2-220	652	410	1062	196	165	65
MS2-230	670	410	1080	196	165	66
MS2-240	688	410	1098	230	185	76
MS2-250	706	410	1116	230	185	76
MS2-260	724	410	1134	230	185	77
MS2-270	742	410	1152	230	185	78
MS2-280	760	410	1170	230	185	79
MS2-290	778	410	1188	230	185	79
MS2-300	796	410	1206	230	185	80
MS2-310	834	465	1299	260	210	105
MS2-320	852	465	1317	260	210	105

Operational performance data

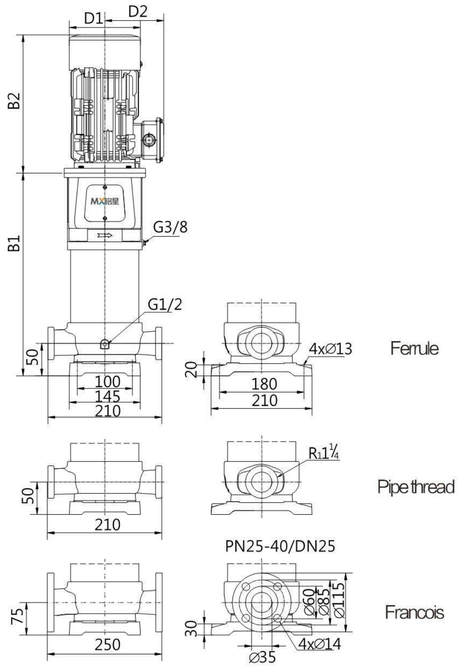
Model	Auxiliary motor (kW)	Q (m³/h)	1.0	1.2	1.6	2.0	2.4	2.8	3.2	3.5
MS2-20	0.37	H (m)	21	20	19	18	17	16	15	13
MS2-30-3	0.37		27	26	24	22	20	18	15	12
MS2-30	0.55		31	30	28	27	26	24	22	20
MS2-40	0.55		41	40	38	37	35	32	30	27
MS2-50	0.75		51	50	48	45	43	40	38	34
MS2-60	0.75		59	57	54	52	48	44	40	35
MS2-70	1.1		71	70	67	64	61	56	53	48
MS2-80	1.1		81	80	77	74	70	65	61	55
MS2-90	1.1		91	90	86	82	78	73	68	62
MS2-100	1.5		101	100	96	92	87	81	76	69
MS2-110	1.5		111	110	105	101	96	89	84	76
MS2-120	1.5		121	120	115	111	105	97	91	83
MS2-130	2.2		131	130	124	120	113	105	99	90
MS2-140	2.2		141	140	134	129	122	113	107	97
MS2-150	2.2		151	150	143	138	131	121	114	104
MS2-160	2.2		162	160	153	148	140	130	122	111

Model	Auxiliary motor (kW)	Q (m³/h)	1.0	1.2	1.6	2.0	2.4	2.8	3.2	3.5
MS2-170	2.2	H (m)	172	170	163	157	149	138	130	118
MS2-180	2.2		181	180	172	165	157	146	137	124
MS2-190	3		191	190	182	174	166	154	145	131
MS2-200	3		201	200	191	183	174	162	152	138
MS2-210	3		211	210	201	193	183	170	160	145
MS2-220	3		221	220	210	202	192	178	167	152
MS2-230	3		232	230	221	212	200	186	175	159
MS2-240	4		242	240	230	221	209	194	182	166
MS2-250	4		253	250	240	230	218	203	190	173
MS2-260	4		263	260	250	239	226	211	198	179
MS2-270	4		273	270	259	248	235	219	205	186
MS2-280	4		283	280	269	258	244	227	213	193
MS2-290	4		293	290	278	267	252	235	220	200
MS2-300	4		303	300	288	276	261	243	228	207
MS2-310	5.5		313	310	298	285	270	251	236	214
MS2-320	5.5		323	320	307	294	278	259	243	221

Performance curve



Mounting dimensions and weight

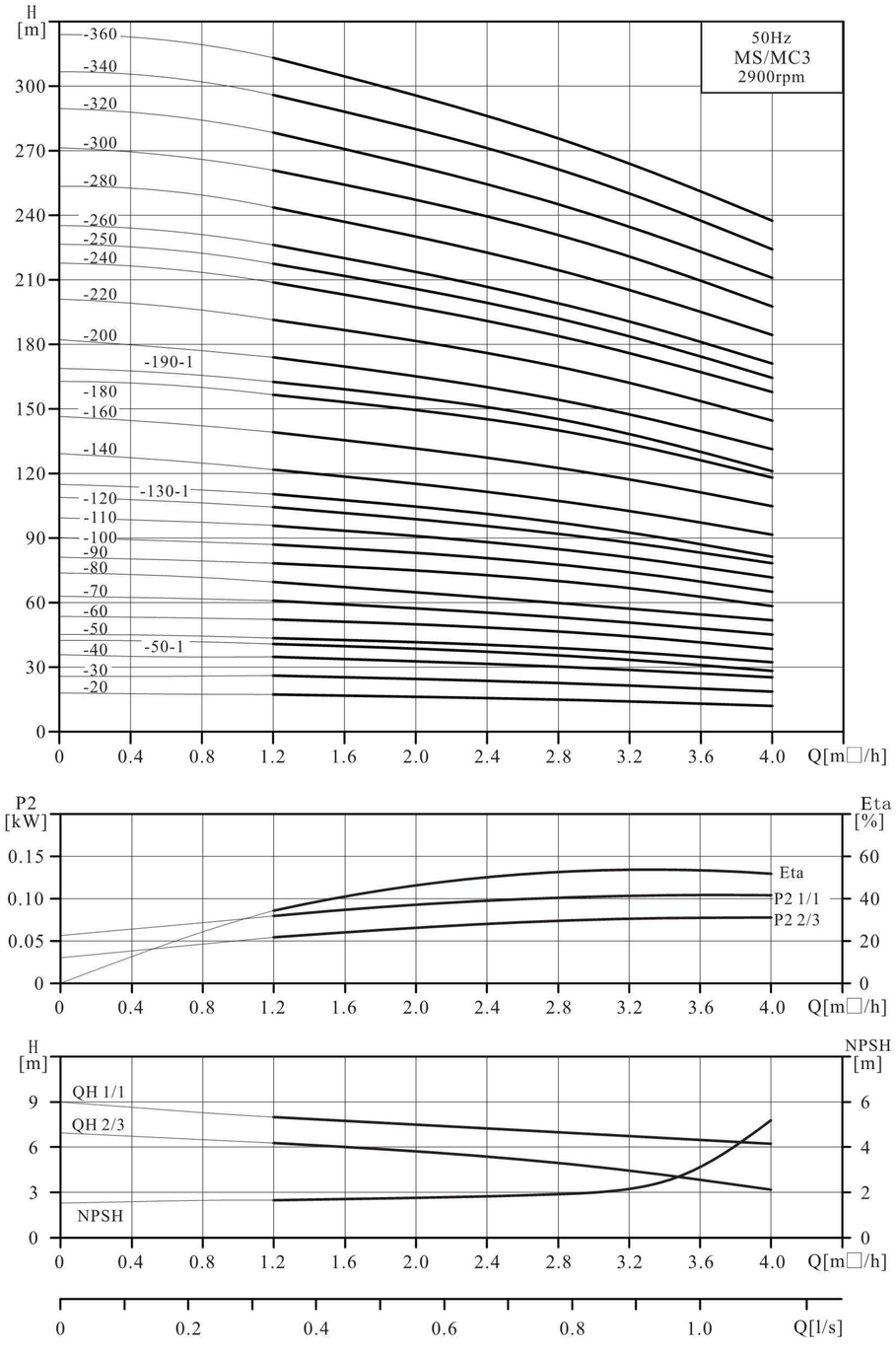


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS3-20	262	240	502	148	117	23
MS3-30	280	240	520	148	117	24
MS3-40	298	240	538	148	117	25
MS3-50-1	316	240	556	148	117	26
MS3-50	326	280	606	170	142	35
MS3-60	344	280	624	170	142	36
MS3-70	362	280	642	170	142	38
MS3-80	380	280	660	170	142	39
MS3-90	398	280	678	170	142	40
MS3-100	426	350	776	190	155	41
MS3-110	444	350	794	190	155	48
MS3-120	462	350	812	190	155	48
MS3-130-1	480	350	830	190	155	49
MS3-140	498	350	848	190	155	54
MS3-160	534	350	884	190	155	54
MS3-180	580	350	930	190	155	55
MS3-190-1	598	350	948	190	155	56
MS3-200	616	410	1026	196	165	63
MS3-220	652	410	1062	196	165	65
MS3-240	688	410	1098	196	165	66
MS3-250	706	410	1116	196	165	67
MS3-260	724	410	1134	230	185	77
MS3-280	760	410	1170	230	185	78
MS3-300	816	410	1226	230	185	79
MS3-320	852	410	1262	230	185	81
MS3-340	888	465	1353	260	210	106
MS3-360	924	465	1389	260	210	108

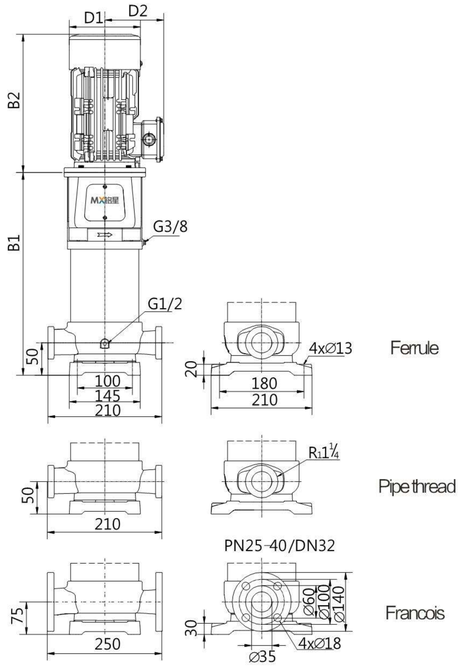
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	1.2	1.6	2	2.4	2.8	3	3.2	3.6	4
MS3-20	0.37		16	15.8	15.5	15.2	14.8	14.5	14	13.5	13
MS3-30	0.37		24.5	24	23.5	23	22.5	22	21.5	20.5	19.5
MS3-40	0.55		32	31.5	31	30.5	30	29.5	28.5	27.5	26
MS3-50-1	0.55		41	40	38	36	35	34.5	33	31	28
MS3-50	0.75		40	39.5	39	38	37	37	36	34	32.5
MS3-60	0.75		48	47.5	47	45.5	44.5	44	43	41	39
MS3-70	1.1		56	55	54.5	53	52	51.5	50	48	45.5
MS3-80	1.1		64	63	62.5	60.5	59	58.5	57	54.5	52
MS3-90	1.1		72	71	70	68	67	66	65	61	59
MS3-100	1.5		80	79	78	76	74	74	72	68	65
MS3-110	1.5		88	87	86	83	81	81	79	75	72
MS3-120	1.5		96	95	94	91	89	88	86	82	78
MS3-130-1	1.5		110	108	105	101	97	95	93	87	81
MS3-140	2.2	H (m)	113	110	110	106	103	103	100	95	91
MS3-160	2.2		129	126	125	121	118	118	115	109	104
MS3-180	2.2		145	142	141	136	133	132	129	123	117
MS3-190-1	2.2		163	159	155	151	145	142	138	130	121
MS3-200	3		161	158	157	152	148	147	143	136	130
MS3-220	3		177	173	172	167	163	162	158	150	143
MS3-240	3		193	189	188	182	177	177	172	164	156
MS3-250	3		201	197	196	190	185	184	179	170	163
MS3-260	4		209	205	204	197	192	191	186	177	169
MS3-280	4		225	221	219	212	207	206	201	191	182
MS3-300	4		241	236	235	227	222	221	215	205	195
MS3-320	4		257	252	251	243	236	236	229	218	208
MS3-340	5.5		273	268	266	258	251	250	244	232	221
MS3-360	5.5		289	284	282	273	266	265	258	245	234

Performance curve



Mounting dimensions and weight



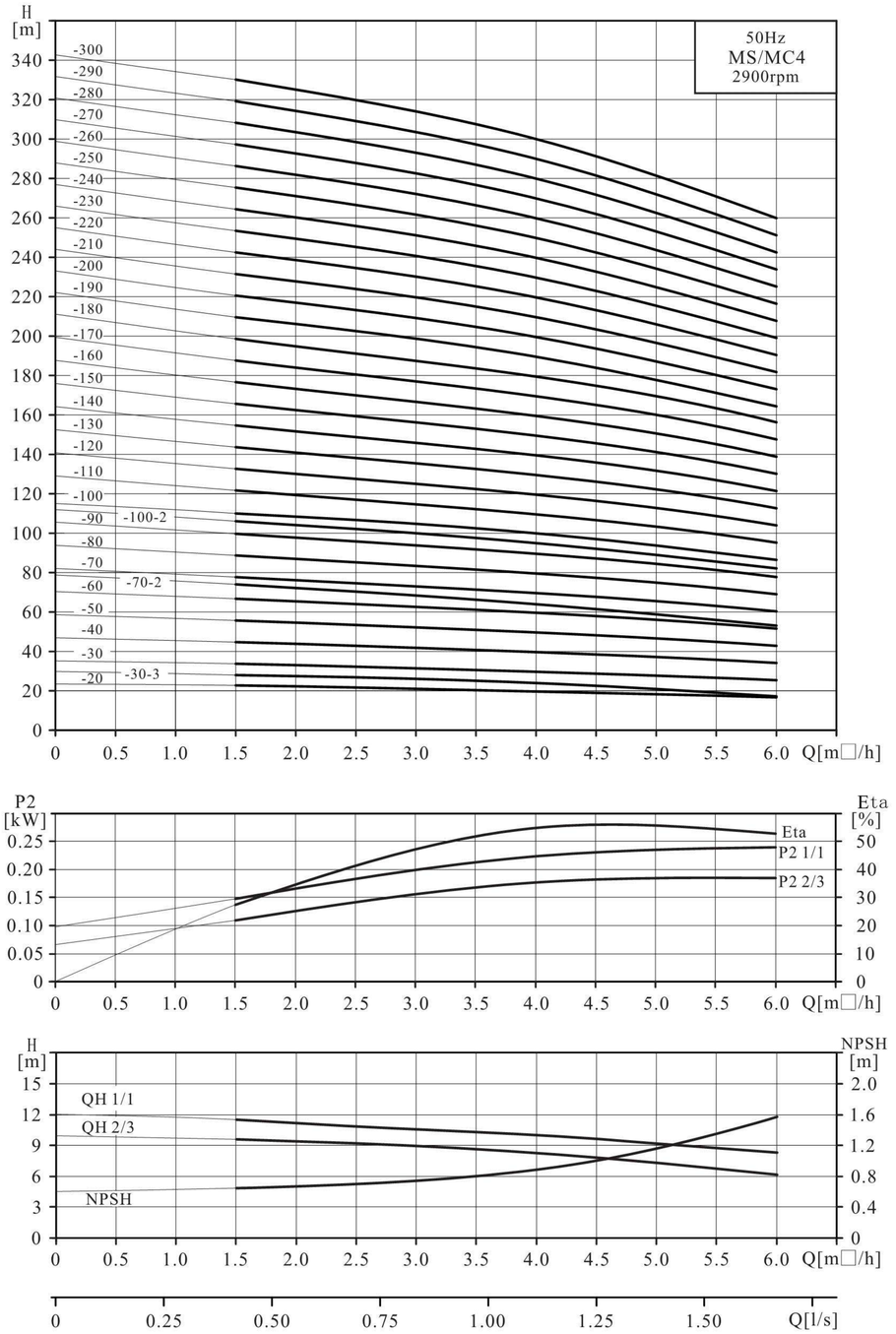
Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS4-20	280	240	520	148	117	24
MS4-30-3	307	240	547	148	117	25
MS4-30	317	280	597	170	142	34
MS4-40	344	280	624	170	142	37
MS4-50	371	280	651	170	142	37
MS4-60	408	350	758	190	155	45
MS4-70-2	435	350	785	190	155	45
MS4-70	435	350	785	190	155	50
MS4-80	462	350	812	190	155	51
MS4-90	489	350	839	190	155	51
MS4-100-2	516	350	866	190	155	52
MS4-100	526	410	936	196	165	59
MS4-110	553	410	963	196	165	60
MS4-120	580	410	990	196	165	61
MS4-130	607	410	1017	196	165	61
MS4-140	634	410	1044	230	185	71
MS4-150	661	410	1071	230	185	72
MS4-160	688	410	1098	230	185	72
MS4-170	715	410	1125	230	185	73
MS4-180	742	410	1152	230	185	74
MS4-190	789	465	1254	260	210	99
MS4-200	816	465	1281	260	210	99
MS4-210	843	465	1308	260	210	100
MS4-220	870	465	1335	260	210	101
MS4-230	897	465	1362	260	210	108
MS4-240	924	465	1389	260	210	109
MS4-250	951	465	1416	260	210	110
MS4-260	978	465	1443	260	210	110
MS4-270	1005	465	1470	260	210	111
MS4-280	1032	465	1497	260	210	112
MS4-290	1059	465	1524	260	210	113
MS4-300	1086	465	1551	260	210	113

Operational performance data

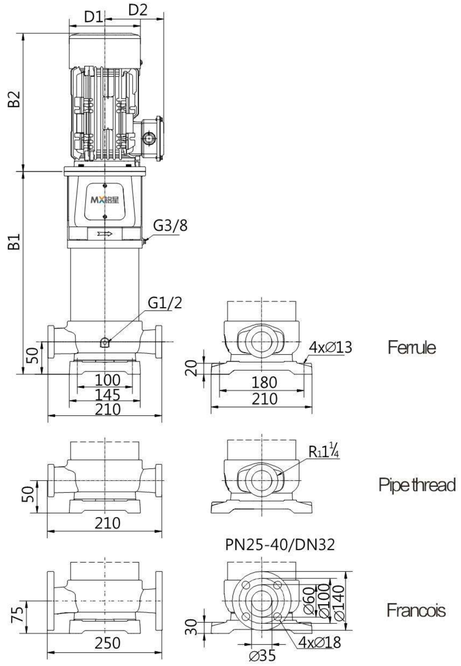
Model	Auxiliary motor (kW)	Q (m^3/h)	1.5	2.0	3.0	4.0	5.0	6.0
MS4-20	0.55	H (m)	23	22	21	20	18	17
MS4-30-3	0.55		28	27	26	24	20	18
MS4-30	0.75		33	32	31	30	28	26
MS4-40	1.1		44	43	41	40	38	35
MS4-50	1.1		55	54	52	50	47	44
MS4-60	1.5		66	65	62	60	56	53
MS4-70-2	1.5		74	72	68	64	59	53
MS4-70	2.2		77	75	73	70	66	61
MS4-80	2.2		88	86	83	80	75	70
MS4-90	2.2		98	97	93	90	85	79
MS4-100-2	2.2		106	104	100	95	90	84
MS4-100	3		110	108	104	100	95	88
MS4-110	3		121	119	114	110	104	97
MS4-120	3		132	130	125	120	113	106
MS4-130	3		143	140	135	130	123	114
MS4-140	4		154	152	145	140	132	123

Model	Auxiliary motor (kW)	Q (m^3/h)	1.5	2.0	3.0	4.0	5.0	6.0
MS4-150	4	H (m)	165	162	156	150	142	132
MS4-160	4		176	173	166	160	151	141
MS4-170	4		187	184	177	170	161	150
MS4-180	4		198	195	187	180	170	159
MS4-190	5.5		210	206	199	190	178	164
MS4-200	5.5		200	217	209	200	187	173
MS4-210	5.5		231	228	220	210	197	182
MS4-220	5.5		242	238	230	220	206	190
MS4-230	7.5		253	249	240	230	215	199
MS4-240	7.5		264	260	251	240	225	208
MS4-250	7.5		275	271	261	250	234	216
MS4-260	7.5		286	282	272	260	244	225
MS4-270	7.5		297	292	282	270	253	234
MS4-280	7.5		308	303	293	280	263	242
MS4-290	7.5		319	314	303	290	290	251
MS4-300	7.5		330	325	314	300	282	236

Performance curve



Mounting dimensions and weight

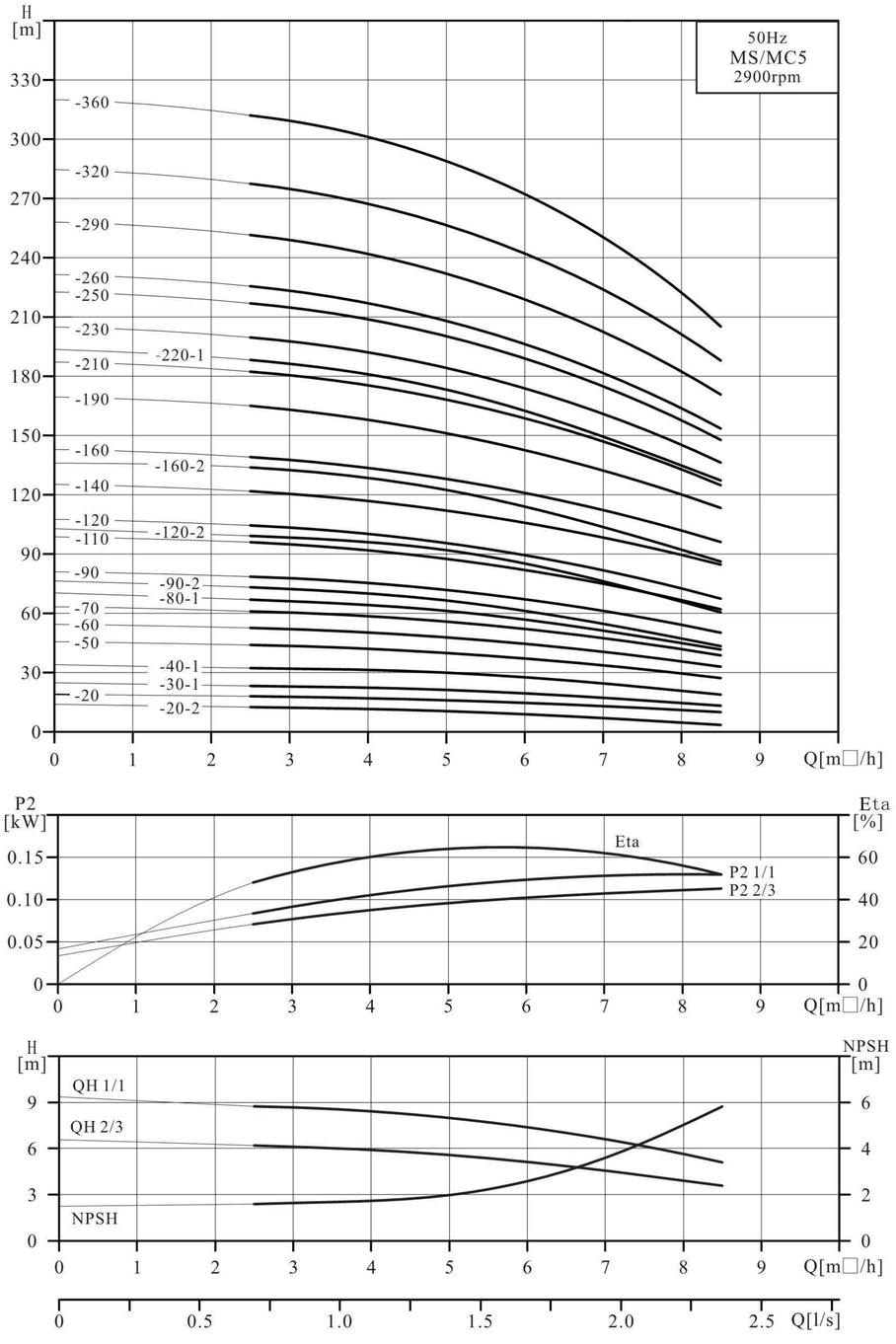


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS5-20-2	280	240	520	148	117	23
MS5-20	280	240	520	148	117	24
MS5-30-1	307	240	547	148	117	24
MS5-40-1	344	280	624	170	142	34
MS5-50	371	280	651	170	142	36
MS5-60	398	280	678	170	142	37
MS5-70	435	350	785	190	155	44
MS5-80-1	462	350	812	190	155	45
MS5-90-2	489	350	839	190	155	46
MS5-90	489	350	839	190	155	50
MS5-110	543	350	893	190	155	50
MS5-120-2	570	350	920	190	155	51
MS5-120	570	350	920	190	155	52
MS5-140	634	410	1044	196	165	59
MS5-160-2	688	410	1098	196	165	61
MS5-160	688	410	1098	196	165	61
MS5-190	769	410	1179	230	185	72
MS5-210	823	410	1233	230	185	74
MS5-220-1	850	410	1260	230	185	74
MS5-230	897	465	1362	260	210	99
MS5-250	951	465	1416	260	210	100
MS5-260	978	465	1443	260	210	101
MS5-290	1059	465	1524	260	210	110
MS5-320	1140	465	1605	260	210	112
MS5-360	1248	465	1713	260	210	115

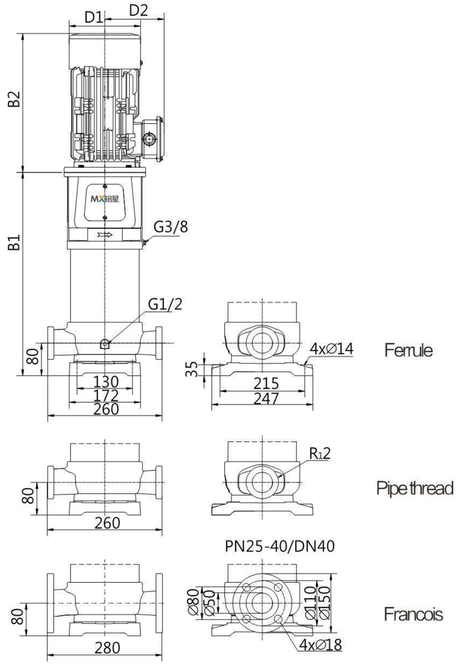
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	2.5	4	5	6	7	8.5
MS5-20-2	0.37		12.5	11.5	10.5	9	7	3.5
MS5-20	0. 55		17	16.5	16	15	14	12
MS5-30-1	0.55		23	22	21	20	17	13
MS5-40-1	0.75		32	31	30	27	24	19
MS5-50	1. 1		43	42	40	38	35	29
MS5-60	1.1		52	50	48	45	42	34
MS5-70	1.5		61	59	56	53	49	40
MS5-80-1	1.5		67	64	61	57	52	42
MS5-90-2	1.5		73	70	67	62	56	43
MS5-90	2.2		78	75	72	68	62	51
MS5-110	2.2		95	92	88	83	76	63
MS5-120-2	2.2	H	99	95	92	85	76	61
MS5-120	2.2	(m)	104	101	96	91	83	68
MS5-140	3		121	117	112	106	97	80
MS5-160-2	3		134	129	123	115	104	83
MS5-160	3		139	134	128	121	111	91
MS5-190	4		165	159	152	143	132	108
MS5-210	4		182	176	168	159	146	120
MS5-220-1	4		188	182	173	163	149	121
MS5-230	5.5		199	193	184	174	160	131
MS5-250	5.5		217	210	200	189	174	143
MS5-260	5.5		225	218	208	196	181	148
MS5-290	7.5		251	243	232	219	201	165
MS5-320	7.5		277	268	256	242	222	182
MS5-360	7.5		312	302	288	272	250	205

Performance curve



Mounting dimensions and weight

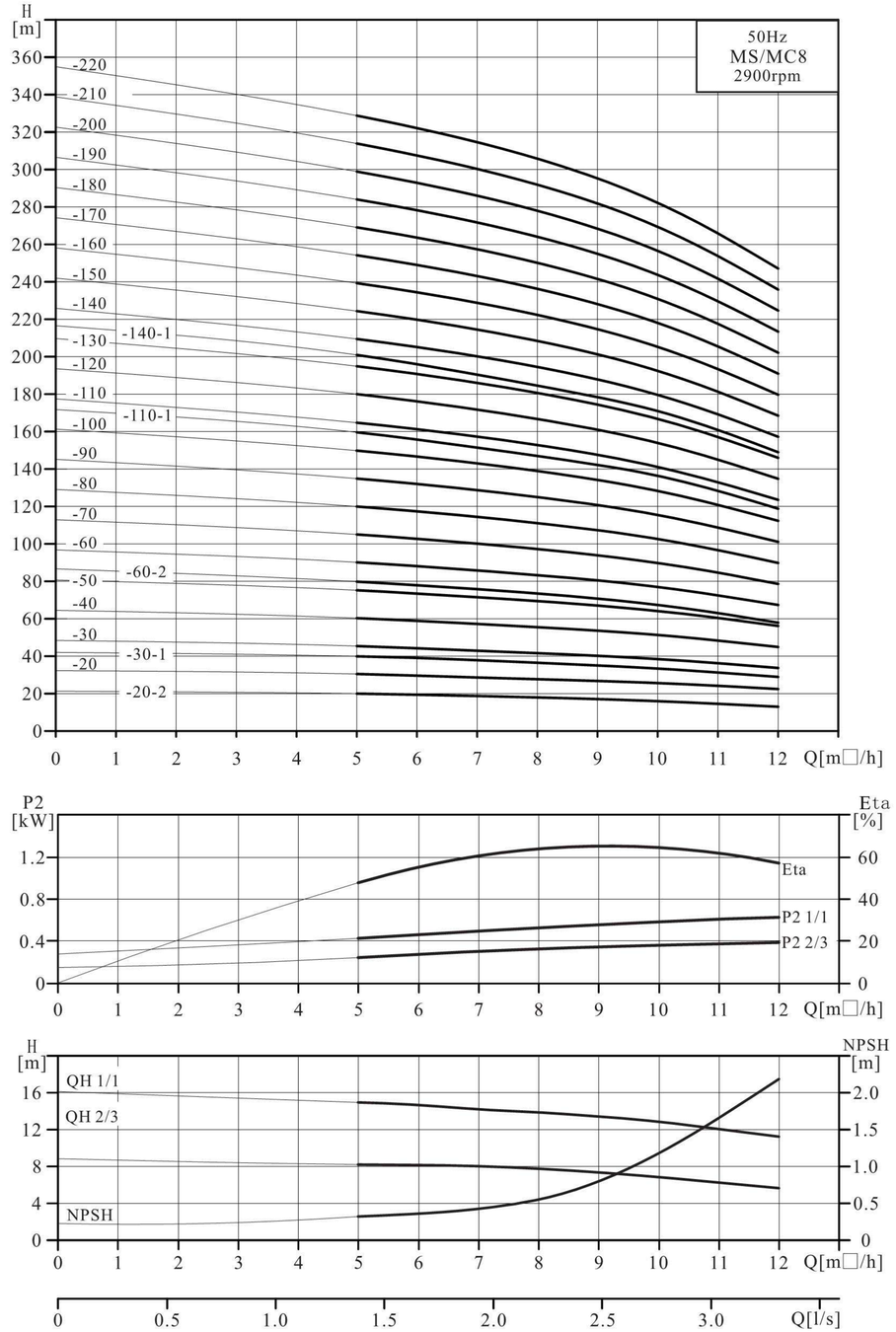


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS8-20-2	355	280	635	170	142	36
MS8-20	355	280	635	170	142	38
MS8-30-1	395	350	745	190	155	46
MS8-30	395	350	745	190	155	50
MS8-40	425	350	775	190	155	51
MS8-50	465	410	875	196	165	58
MS8-60-2	495	410	905	196	165	59
MS8-60	495	410	905	230	185	68
MS8-70	525	410	935	230	185	69
MS8-80	555	410	965	230	185	70
MS8-90	605	465	1070	260	210	96
MS8-100	635	465	1100	260	210	97
MS8-110-1	665	465	1130	260	210	98
MS8-110	665	465	1130	260	210	105
MS8-120	695	465	1160	260	210	106
MS8-130	725	465	1190	260	210	107
MS8-140-1	755	465	1220	260	210	108
MS8-140	843	610	1453	350	260	162
MS8-150	873	610	1483	350	260	163
MS8-160	903	610	1513	350	260	164
MS8-170	933	610	1543	350	260	165
MS8-180	963	610	1573	350	260	166
MS8-190	993	610	1603	350	260	174
MS8-200	1023	610	1633	350	260	175
MS8-210	1053	610	1663	350	260	176
MS8-220	1083	610	1693	350	260	177

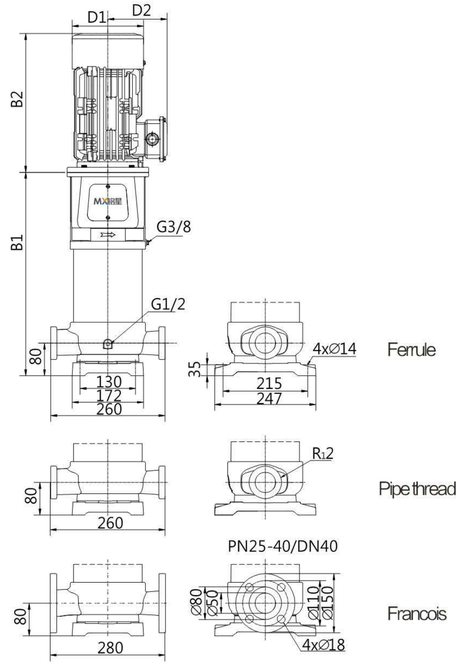
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	5	6	7	8	9	10	11	12
MS8-20-2	0.75		20	19.5	19	18	17	16	14	13
MS8-20	1.1		30	29	28	27	26	25.5	24	22
MS8-30-1	1.5		40	39	38	36	35	34	31	29
MS8-30	2.2		45	44	42.5	41	40.5	38.5	36	34
MS8-40	2.2		60	58.5	56.5	55	54	51	48	45
MS8-50	3		75	73	71	68	68	64	60	56
MS8-60-2	3		80	78	76	73	71	67	62	58
MS8-60	4		90	88	85	82	81	77	72	67
MS8-70	4		105	103	99	96	95	90	84	79
MS8-80	4		120	117	113	110	108	103	96	90
MS8-90	5.5		135	132	127	124	122	116	108	101
MS8-100	5.5		150	147	142	137	135	128	121	112
MS8-110-1	5.5		160	156	151	147	144	136	128	119
MS8-110	7.5		165	161	156	151	149	141	133	124
MS8-120	7.5	H (m)	180	176	170	165	162	154	145	135
MS8-130	7.5		195	191	184	179	176	167	157	146
MS8-140-1	7.5		201	196	190	185	180	171	160	149
MS8-140	11		210	205	198	193	189	180	169	157
MS8-150	11		224	220	212	206	203	193	181	168
MS8-160	11		239	235	226	220	216	205	193	180
MS8-170	11		254	249	241	234	230	218	205	191
MS8-180	11		269	264	255	248	244	231	217	202
MS8-190	15		284	279	269	262	257	244	229	213
MS8-200	15		299	294	283	276	271	257	241	224
MS8-210	15		314	309	297	287	284	270	253	235
MS8-220	15		329	324	311	300	297	283	265	246

Performance curve



Mounting dimensions and weight

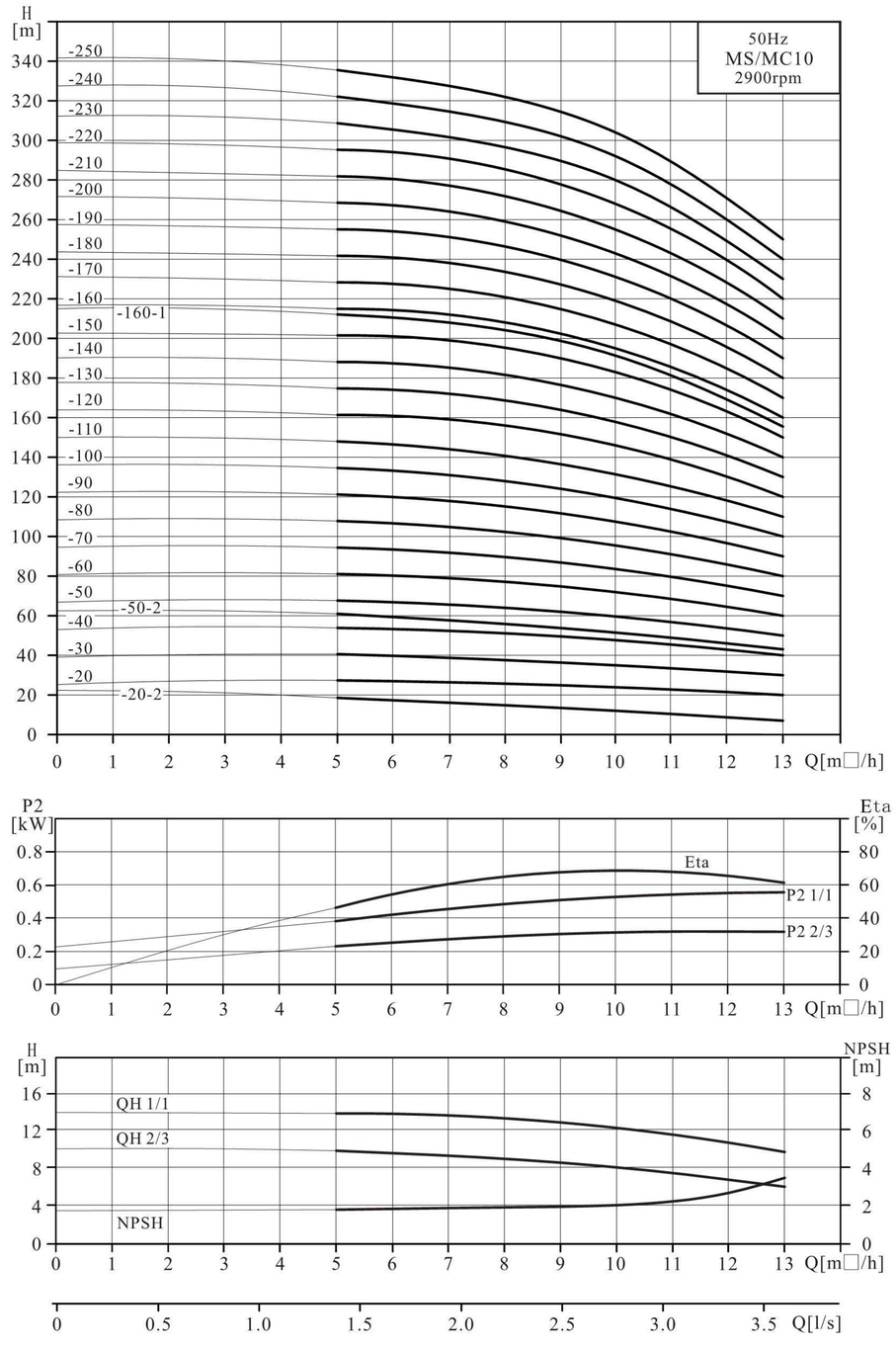


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS10-20-2	355	280	635	170	142	37
MS10-20	355	280	635	170	142	39
MS10-30	395	350	745	170	142	47
MS10-40	425	350	775	190	155	52
MS10-50-2	455	350	805	190	155	53
MS10-50	465	410	875	196	165	59
MS10-60	495	410	905	196	165	60
MS10-70	525	410	935	230	185	70
MS10-80	555	410	965	230	185	71
MS10-90	605	465	1070	260	210	98
MS10-100	635	465	1100	260	210	99
MS10-110	665	465	1130	260	210	100
MS10-120	695	465	1160	260	210	108
MS10-130	725	465	1190	260	210	109
MS10-140	755	465	1220	260	210	110
MS10-150	785	465	1250	260	210	111
MS10-160-1	815	465	1280	260	210	112
MS10-160	903	610	1513	350	260	167
MS10-170	933	610	1543	350	260	168
MS10-180	963	610	1573	350	260	169
MS10-190	993	610	1603	350	260	170
MS10-200	1023	610	1633	350	260	171
MS10-210	1053	610	1663	350	260	173
MS10-220	1083	610	1693	350	260	181
MS10-230	1113	610	1723	350	260	182
MS10-240	1143	610	1753	350	260	183
MS10-250	1173	610	1783	350	260	184

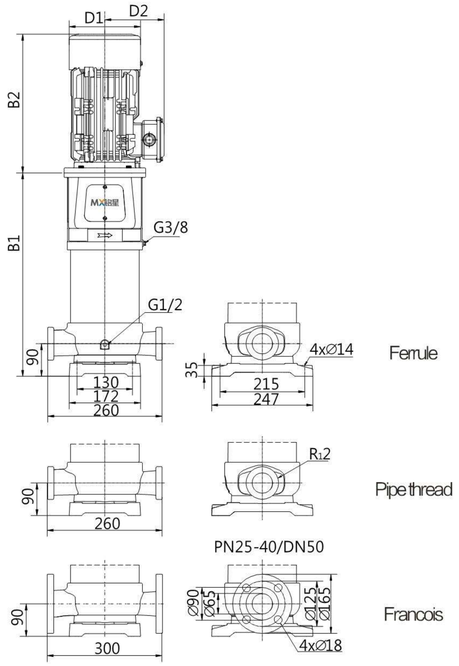
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	5	6	7	8	9	10	11	12	13
MS10-20-2	0.75	H (m)	18.5	17	16	14	13	12	10	8.5	7
MS10-20	1.1		28	27	26	25.5	25	24	23	22	20
MS10-30	1.5		41	40	39.5	38	37	35	34	32	30
MS10-40	2.2		55	53	52	51	49.5	48	46	43	40
MS10-50-2	2.2		61	59	58	56	54	51.5	49	47	43
MS10-50	3		68	67	66	64	62	60	57	54	50
MS10-60	3		82	79	78	77	74	72	69	65	60
MS10-70	4		96	93	92	90	87	84	80	75	70
MS10-80	4		109	107	105	103	99	96	91	86	80
MS10-90	5. 5		123	120	118	115	111	108	103	97	90
MS10-100	5. 5		137	134	131	128	124	120	114	108	100
MS10-110	5. 5		150	147	144	141	136	132	126	118	110
MS10-120	7. 5		164	160	157	154	149	144	137	129	120
MS10-130	7. 5		177	174	170	167	161	156	149	140	130
MS10-140	7. 5		191	187	183	179	173	168	160	151	140
MS10-150	7. 5		205	200	197	192	186	180	171	162	150
MS10-160-1	7.5		214	211	208	204	199	191	181	168	154
MS10-160	11		218	214	210	205	198	192	183	172	160
MS10-170	11		232	227	223	218	210	204	194	183	170
MS10-180	11		246	240	236	231	223	216	206	194	180
MS10-190	11		259	254	249	244	235	228	217	205	190
MS10-200	11		273	267	262	256	248	240	229	215	200
MS10-210	11		287	280	275	269	260	252	240	226	210
MS10-220	15		300	294	288	282	272	264	251	237	220
MS10-230	15		309	305	301	297	290	280	266	249	230
MS10-240	15		322	319	314	309	302	292	278	260	240
MS10-250	15		335	332	327	322	314	304	289	271	250

Performance curve



Mounting dimensions and weight

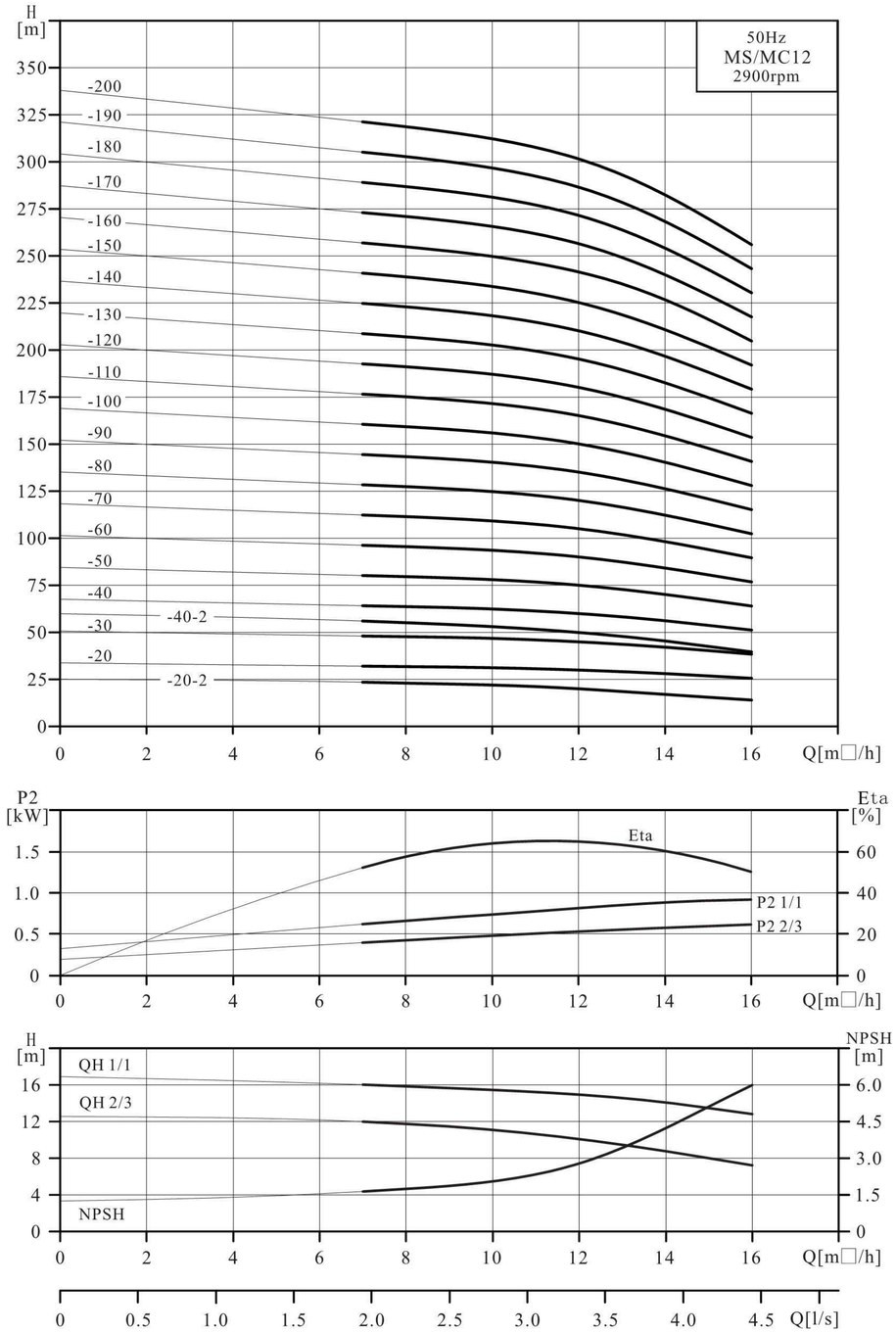


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS12-20-2	365	350	715	190	155	47
MS12-20	365	350	715	190	155	51
MS12-30	405	410	815	196	165	58
MS12-40-2	435	410	845	196	165	59
MS12-40	435	410	845	230	185	68
MS12-50	485	465	950	260	210	94
MS12-60	515	465	980	260	210	95
MS12-70	545	465	1010	260	210	103
MS12-80	575	465	1040	260	210	104
MS12-90	693	610	1303	350	260	159
MS12-100	723	610	1333	350	260	160
MS12-110	753	610	1363	350	260	161
MS12-120	783	610	1393	350	260	163
MS12-130	813	610	1423	350	260	171
MS12-140	843	610	1453	350	260	172
MS12-150	873	610	1483	350	260	173
MS12-160	903	610	1513	350	260	174
MS12-170	933	610	1543	350	260	175
MS12-180	963	640	1603	350	260	198
MS12-190	993	640	1633	350	260	199
MS12-200	1023	640	1663	350	260	200

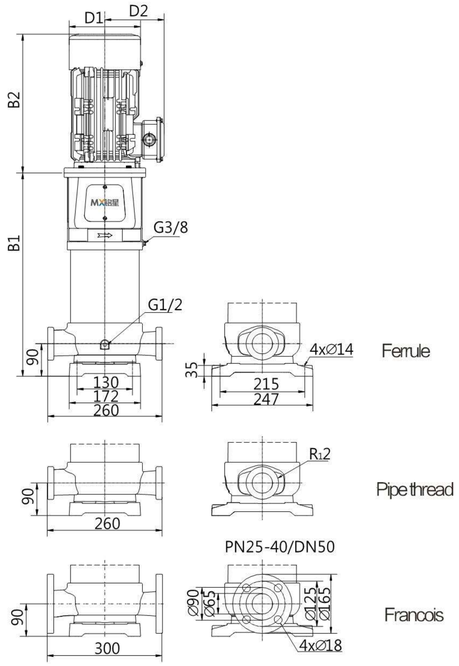
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	7	8	9	10	11	12	13	14	15	16
MS12-20-2	1.5	H (m)	24	23	23	22	21	20	19	17	16	14
MS12-20	2.2		32.5	32	31.5	31	30.5	30	29	28	27	26
MS12-30	3		48	47.5	47	46.5	46	45	44	42	41	38
MS12-40-2	3		56	55	54	53	52	50	48	45	43	40
MS12-40	4		64	63.5	63	62	61	60	59	56	54	51
MS12-50	5.5		80	79.5	79	78	77	75	74	71	68	64
MS12-60	5.5		96	95	94	93	92	90	88	85	81	77
MS12-70	7.5		112	111	110	109	107	105	103	99	95	90
MS12-80	7.5		128	127	126	124	122	120	118	113	108	102
MS12-90	11		144	143	141	140	138	135	132	127	122	115
MS12-100	11		160	159	157	155	153	150	147	141	135	128
MS12-110	11		176	175	173	171	168	165	162	155	149	141
MS12-120	11		192	191	188	186	184	180	176	169	162	154
MS12-130	15		208	207	204	202	199	195	191	183	176	166
MS12-140	15		224	223	220	217	214	210	206	197	189	179
MS12-150	15		240	239	236	233	230	225	221	212	203	192
MS12-160	15		256	254	251	248	245	240	235	226	216	205
MS12-170	15		272	270	267	264	260	255	250	240	230	217
MS12-180	18.5		288	286	283	279	276	270	265	254	243	230
MS12-190	18.5		304	302	298	295	291	285	279	268	257	243
MS12-200	18.5		320	318	314	310	306	300	294	282	270	256

Performance curve



Mounting dimensions and weight

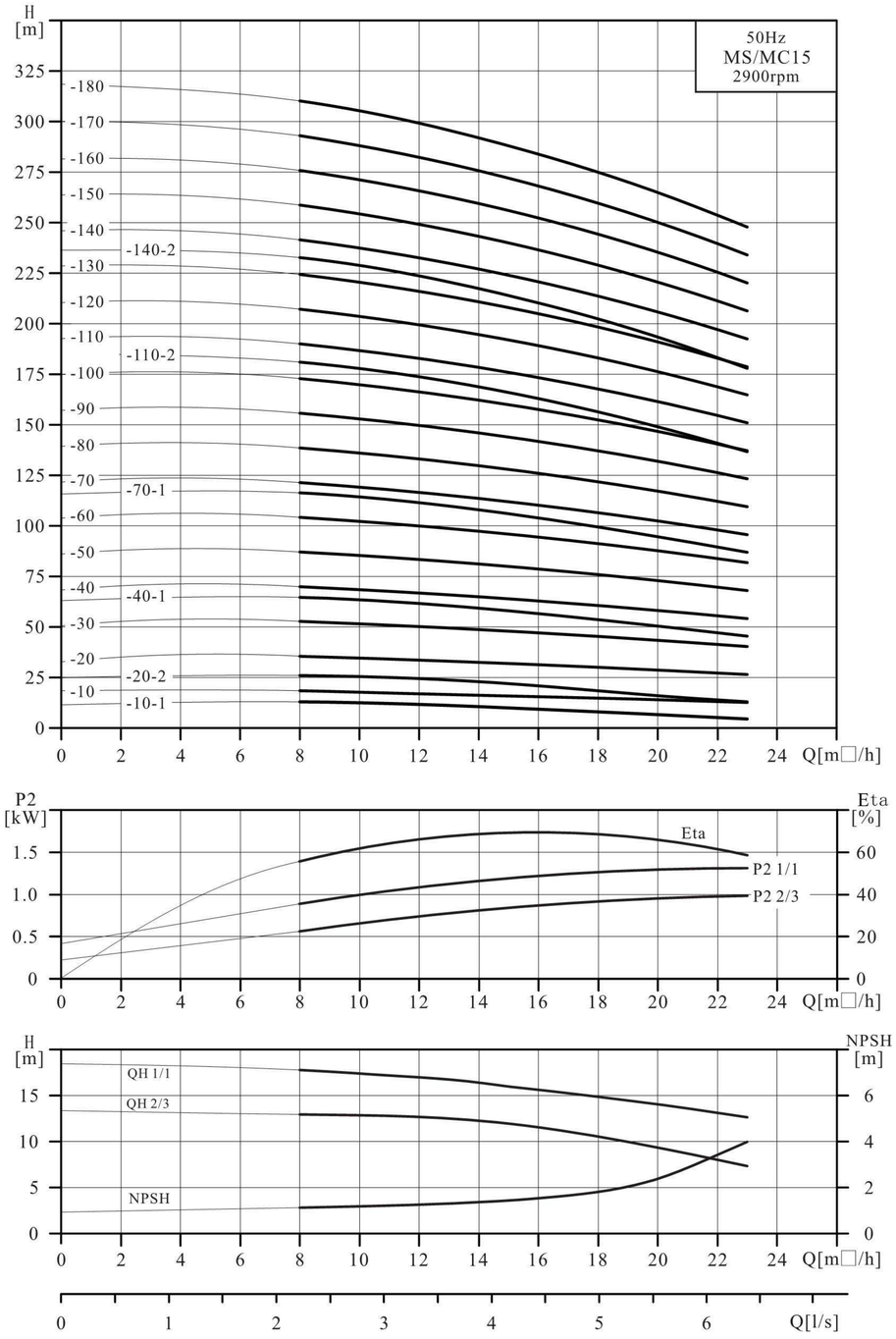


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS15-10-1	346	280	626	170	142	39
MS15-10	356	350	706	190	155	45
MS15-20-2	401	350	751	190	155	51
MS15-20	411	410	821	196	165	58
MS15-30	456	410	866	230	185	68
MS15-40-1	501	410	911	230	185	69
MS15-40	521	465	986	260	210	93
MS15-50	566	465	1031	260	210	94
MS15-60	611	465	1076	260	210	102
MS15-70-1	656	465	1121	260	210	103
MS15-70	744	610	1354	350	260	158
MS15-80	789	610	1399	350	260	159
MS15-90	834	610	1444	350	260	160
MS15-100	879	610	1489	350	260	161
MS15-110-2	924	610	1534	350	260	162
MS15-110	924	610	1534	350	260	171
MS15-120	969	610	1579	350	260	172
MS15-130	1014	610	1624	350	260	173
MS15-140-2	1059	610	1669	350	260	174
MS15-140	1059	640	1699	350	260	196
MS15-150	1104	640	1744	350	260	197
MS15-160	1149	640	1789	350	260	198
MS15-170	1194	670	1864	360	285	232
MS15-180	1239	670	1909	360	285	233

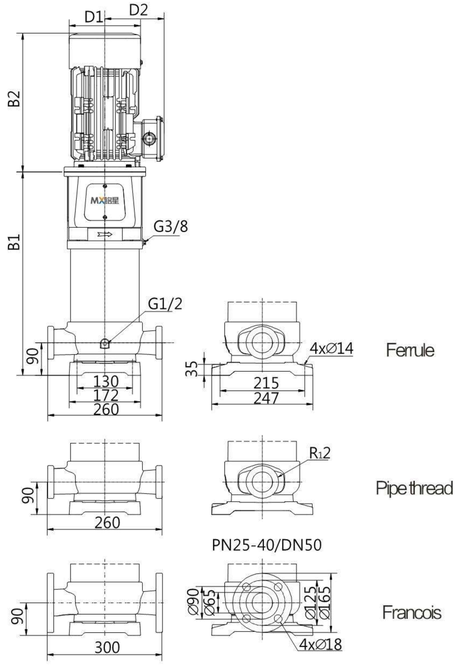
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	8	10	12	14	15	16	18	20	23
MS15-10-1	1.1	H (m)	13	12	11.5	10.5	10	9	7.5	6	4.5
MS15-10	1.5		17.5	17	16.6	16.3	16	15.5	15	14.5	14
MS15-20-2	2.2		26	25	24	23	22	20.5	18	16	13
MS15-20	3		34.5	34	33	32.5	32	31.5	30.5	29.5	28
MS15-30	4		52	51	50	49	48	47.5	46	44.5	41
MS15-40-1	4		65	63	61	59	58	57	54	51	46
MS15-40	5.5		69	68	66.5	65	64	63	61	59	55
MS15-50	5.5		86	85	83	81	80	79	77	74	69
MS15-60	7.5		103	102	100	98	96	95	92	89	83
MS15-70-1	7.5		116	114	111	108	106	104	99	95	87
MS15-70	11		121	119	116	114	112	111	107	104	96
MS15-80	11		138	136	133	130	128	127	122	118	110
MS15-90	11		155	153	149	146	144	143	138	133	124
MS15-100	11		172	170	166	163	160	158	153	148	138
MS15-110-2	11		181	178	173	169	166	163	156	149	137
MS15-110	15		190	187	183	179	176	174	168	163	151
MS15-120	15		207	204	199	195	192	190	184	177	165
MS15-130	15		224	221	216	212	208	206	199	192	179
MS15-140-2	15		233	229	223	218	214	211	202	193	178
MS15-140	18.5		241	238	232	228	224	222	214	207	193
MS15-150	18.5		258	255	249	244	240	238	230	222	206
MS15-160	18.5		276	272	266	260	256	253	245	237	220
MS15-170	22		293	288	282	277	272	269	260	251	234
MS15-180	22		310	305	299	293	288	285	275	266	248

Performance curve



Mounting dimensions and weight

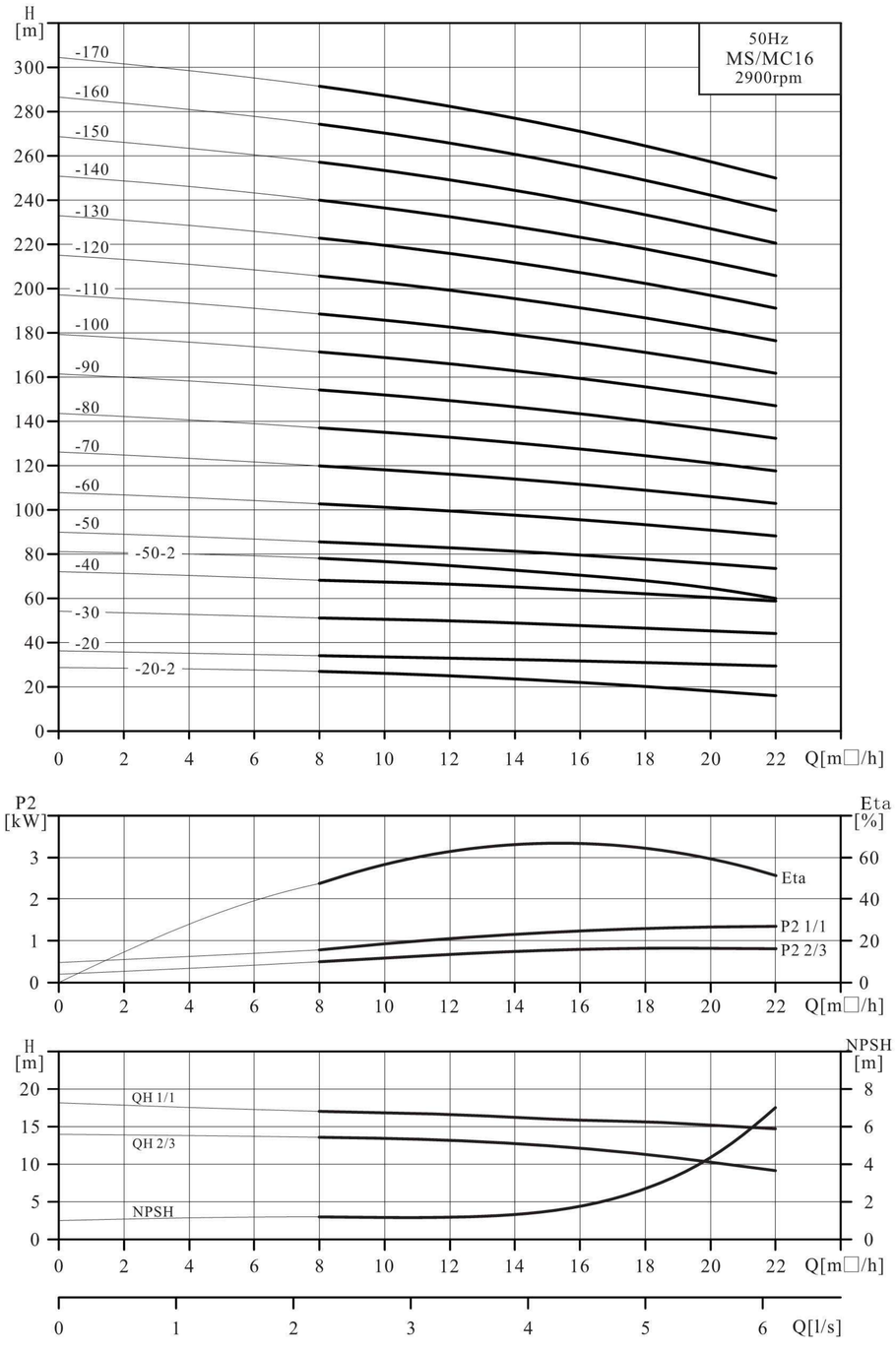


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS16-20-2	401	350	751	190	155	51
MS16-20	411	410	821	196	165	58
MS16-30	456	410	866	230	185	68
MS16-40	521	465	986	260	210	93
MS16-50-2	566	465	1031	260	210	94
MS16-50	566	465	1031	260	210	101
MS16-60	611	465	1076	260	210	102
MS16-70	744	610	1354	350	260	159
MS16-80	789	610	1399	350	260	159
MS16-90	834	610	1444	350	260	160
MS16-100	879	610	1489	350	260	168
MS16-110	924	610	1534	350	260	169
MS16-120	969	610	1579	350	260	171
MS16-130	1014	640	1654	350	260	194
MS16-140	1059	640	1699	350	260	195
MS16-150	1104	670	1774	360	285	228
MS16-160	1149	670	1819	360	285	229
MS16-170	1194	670	1864	360	285	231

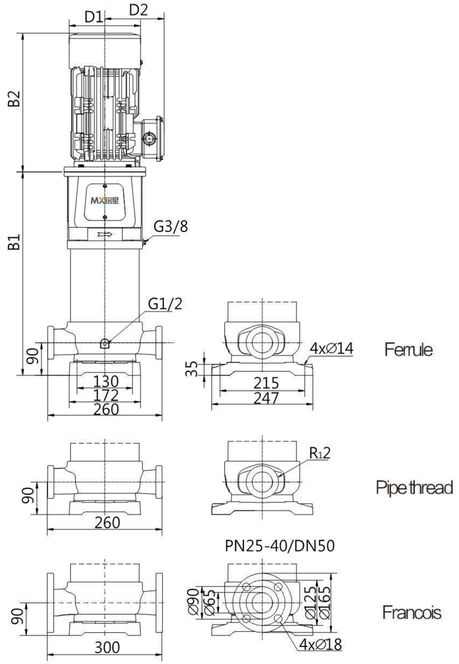
Operational performance data

Model	Auxiliary motor（kW）	Q (m³/h)	8	10	12	14	16	18	20	22
MS16-20-2	2.2		27	26	25	24	22	21	19	16
MS16-20	3		34	33.5	33	32.5	32	31	30	29
MS16-30	4		51	50.5	50	48.5	48	47	46	44
MS16-40	5.5		68	67	66	64.5	63.5	63	61	59
MS16-50-2	5.5		78	77	75	73	70	68	65	60
MS16-50	7.5		85	84	83	81	79	78	76	74
MS16-60	7.5		102	101	100	97	95	94	91	88
MS16-70	11		119	118	116	113	110	109	106	103
MS16-80	11	H	136	135	133	129	126	125	122	118
MS16-90	11	(m)	153	152	149	145	142	141	137	132
MS16-100	15		170	168	166	161	158	156	152	147
MS16-110	15		187	185	183	178	173	172	167	162
MS16-120	15		204	202	199	194	189	188	183	176
MS16-130	18.5		222	219	216	210	205	203	198	191
MS16-140	18.5		239	236	233	226	221	219	213	206
MS16-150	22		256	253	250	242	237	235	229	220
MS16-160	22		273	270	267	258	253	250	244	235
MS16-170	22		290	287	284	274	269	266	259	250

Performance curve



Mounting dimensions and weight

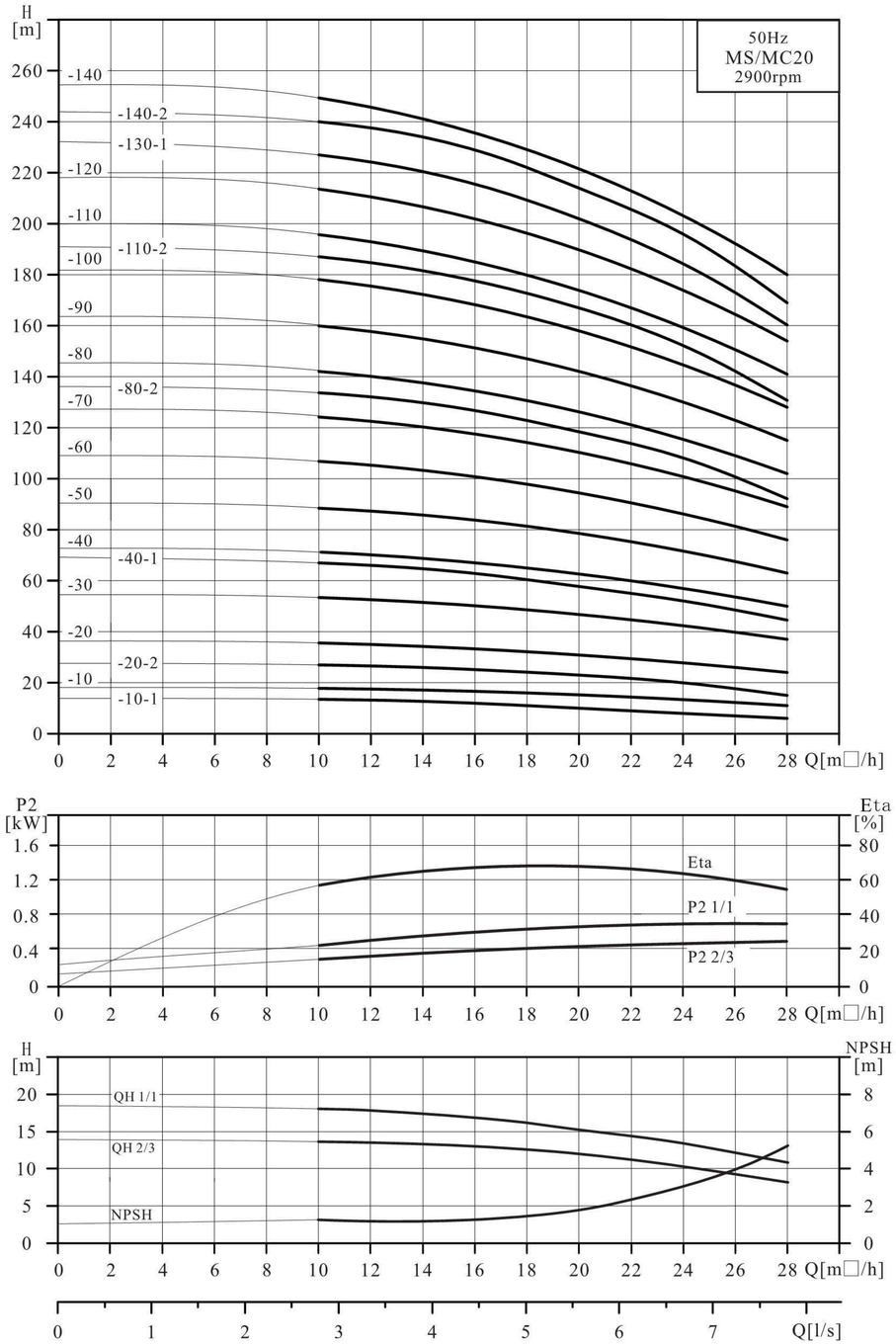


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS20-10-1	356	280	636	170	142	40
MS20-10	356	350	706	190	155	47
MS20-20-2	411	350	761	190	155	52
MS20-20	411	410	821	230	185	67
MS20-30	476	465	941	260	210	94
MS20-40-1	521	465	986	260	210	95
MS20-40	521	465	986	260	210	103
MS20-50	566	465	1031	260	210	105
MS20-60	699	610	1309	350	260	160
MS20-70	744	610	1354	350	260	161
MS20-80-2	789	610	1399	350	260	162
MS20-80	789	610	1399	350	260	169
MS20-90	834	610	1444	350	260	171
MS20-100	879	610	1489	350	260	172
MS20-110-2	924	610	1534	350	260	173
MS20-110	924	640	1564	350	260	197
MS20-120	969	640	1609	350	260	198
MS20-130-1	1014	640	1654	350	260	199
MS20-140-2	1059	670	1729	360	285	233
MS20-140	1059	670	1729	360	285	234

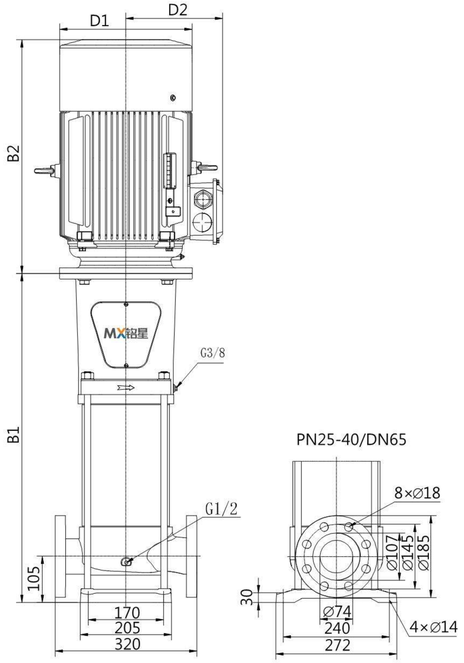
Operational performance data

Model	Auxiliary motor（kW）	Q (m³/h)	10	12	14	16	18	20	22	24	26	28
MS20-10-1	1.1		13.5	13	12.5	12	11	10	9	8	7	6
MS20-10	1.5		18	17.5	17	16.5	16	15.5	15	14.5	14	13
MS20-20-2	2.2		27	26.5	26	25	24	23	22	20	18	15
MS20-20	4		36	35	34.5	34	33	32	31	29	28	26
MS20-30	5.5		53.5	53	52	51	49	48	46	44	41	39
MS20-40-1	5.5		67	66	64	63	60	58	55	52	48	45
MS20-40	7.5		71	70	69	68	66	64	62	59	55	51
MS20-50	7.5		89	88	86	85	82	80	77	74	69	64
MS20-60	11		107	105	104	102	98	95	92	88	83	77
MS20-70	11	H	125	123	121	119	115	111	108	103	96	90
MS20-80-2	11	(m)	134	132	130	127	122	118	114	108	101	92
MS20-80	15		142	140	138	136	131	127	123	118	110	103
MS20-90	15		160	158	155	153	148	143	138	132	124	116
MS20-100	15		178	176	173	170	164	159	154	147	138	129
MS20-110-2	15		187	185	181	178	172	167	160	152	142	131
MS20-110	18.5		196	193	190	187	180	175	169	162	151	141
MS20-120	18.5		213	211	207	204	197	191	185	176	165	154
MS20-130-1	18.5		227	224	220	216	208	202	194	184	172	160
MS20-140-2	22		240	237	233	229	221	214	207	196	183	169
MS20-140	22		249	246	242	237	230	223	215	206	193	180

Performance curve



Mounting dimensions and weight



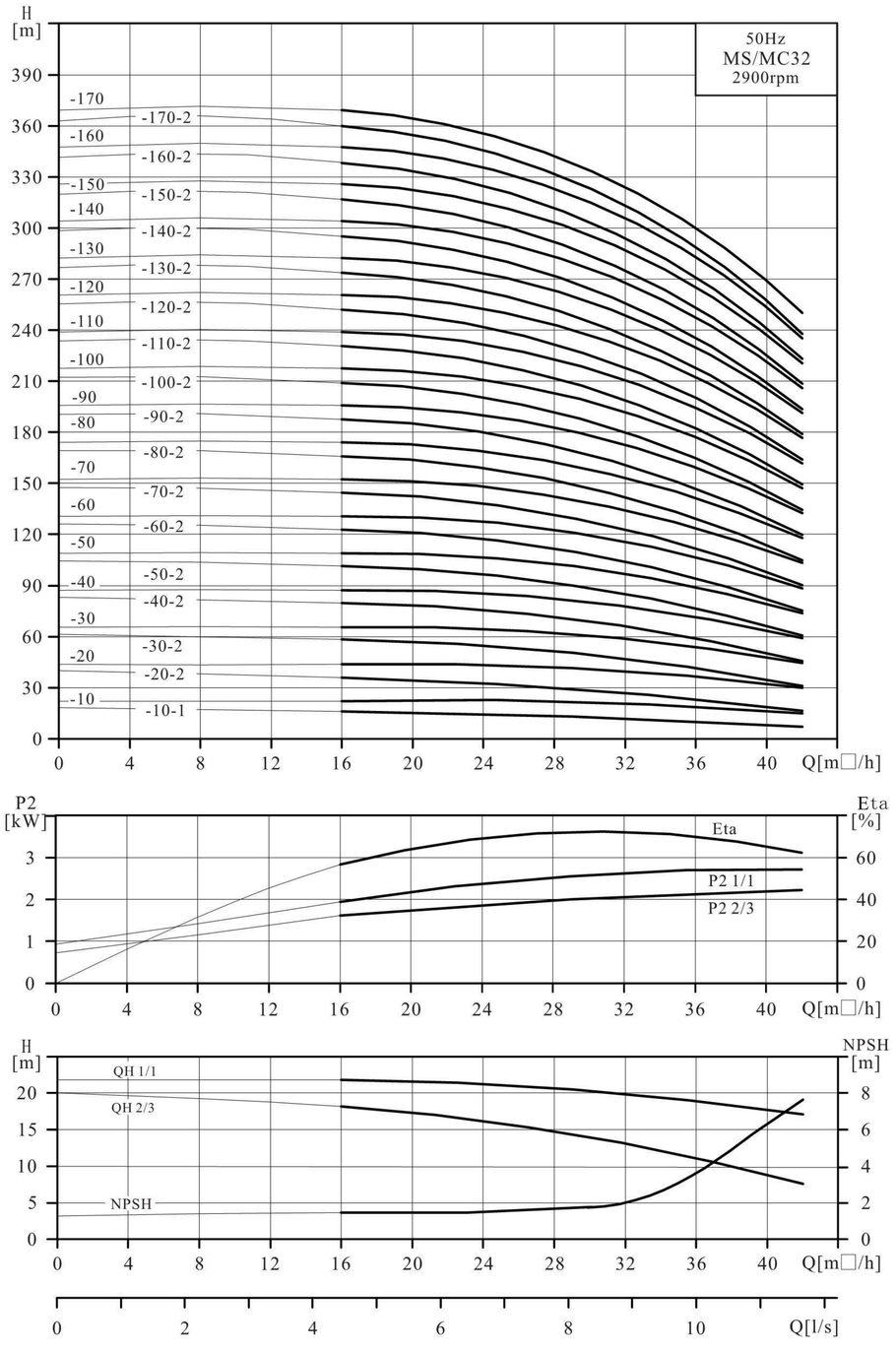
Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS32-10-1	455	350	805	190	155	61
MS32-10	455	410	865	196	165	67
MS32-20-2	525	410	935	230	185	78
MS32-20	525	465	990	260	210	102
MS32-30-2	595	465	1060	260	210	111
MS32-30	700	610	1310	350	260	167
MS32-40-2/MS32-40	770	610	1380	350	260	169
MS32-50-2/MS32-50	840	610	1450	350	260	178
MS32-60-2	910	610	1520	350	260	180
MS32-60	910	640	1550	350	260	202
MS32-70-2/MS32-70	980	640	1620	350	260	204
MS32-80-2/MS32-80	1050	670	1720	360	285	240
MS32-90-2	1120	670	1790	360	285	242
MS32-90	1120	715	1835	400	310	310
MS32-100-2/MS32-100	1190	715	1905	400	310	316
MS32-110-2/MS32-110	1260	715	1975	400	310	318
MS32-120-2	1330	715	2045	400	310	320
MS32-120	1330	715	2045	400	310	334
MS32-130-2/MS32-130	1400	715	2115	400	310	336
MS32-140-2/MS32-140	1470	715	2185	400	310	338
MS32-150-2/MS32-150	1540	740	2280	460	340	411
MS32-160-2/MS32-160	1610	740	2350	460	340	413
MS32-170-2/MS32-170	1680	740	2420	460	340	415

Operational performance data

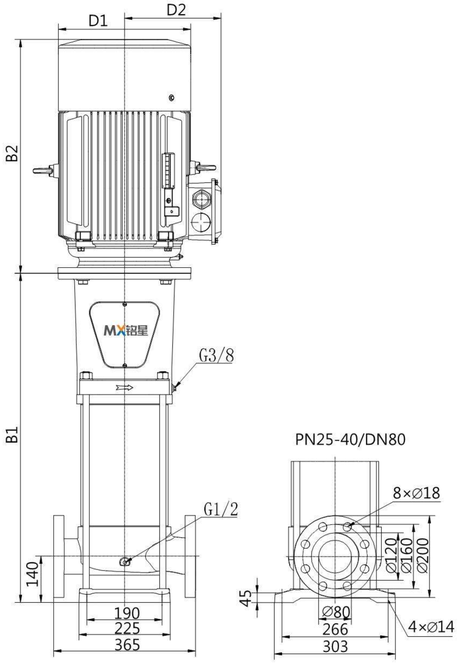
Model	Auxiliary motor (kW)	Q (m³/h)	16	20	24	28	32	36	40	42
MS32-10-1	2.2	H (m)	18	17	15	14	13	11	8	7
MS32-10	3		22	21.5	21	20	19	18	16	15
MS32-20-2	4		36	34	32	29	27	23	18	17
MS32-20	5.5		43	42.5	42	40	38	35	32	29
MS32-30-2	7.5		58	55	53	49	46	41	34	31
MS32-30	11		65	64	63	61	57	53	48	44
MS32-40-2	11		79	77	74	69	65	58	50	46
MS32-40	11		86	85	83	81	77	71	63	59
MS32-50-2	15		101	98	95	90	84	76	66	61
MS32-50	15		108	107	104	101	96	88	79	74
MS32-60-2	15		122	119	115	110	104	94	81	75
MS32-60	18.5		129	128	125	121	115	106	95	88
MS32-70-2	18.5		144	141	136	130	123	111	97	90
MS32-70	18.5		151	149	146	141	134	124	111	103
MS32-80-2	22		165	162	157	150	142	129	113	105
MS32-80	22		172	171	167	162	153	142	127	118
MS32-90-2	22		187	183	178	170	161	147	129	120
MS32-90	30		194	192	188	182	172	159	143	133
MS32-100-2	30		208	205	199	191	180	165	145	134

Model	Auxiliary motor (kW)	Q (m³/h)	16	20	24	28	32	36	40	42
MS32-100	30	H (m)	215	214	208	202	191	177	159	147
MS32-110-2	30		230	226	220	211	199	182	161	149
MS32-110	30		237	235	229	222	210	195	174	162
MS32-120-2	30		251	248	240	231	218	200	177	164
MS32-120	37		258	256	250	242	230	212	190	177
MS32-130-2	37		273	269	261	251	237	218	192	179
MS32-130	37		280	278	271	263	249	230	206	192
MS32-140-2	37		294	290	282	271	257	235	208	193
MS32-140	37		301	299	292	283	268	248	222	206
MS32-150-2	45		316	312	303	292	276	253	224	208
MS32-150	45		323	320	313	303	287	265	238	221
MS32-160-2	45		337	333	324	312	295	271	240	223
MS32-160	45		345	342	333	323	306	283	254	236
MS32-170-2	45		359	354	345	332	314	288	256	238
MS32-170	45		366	363	354	343	325	301	270	251

Performance curve



Mounting dimensions and weight

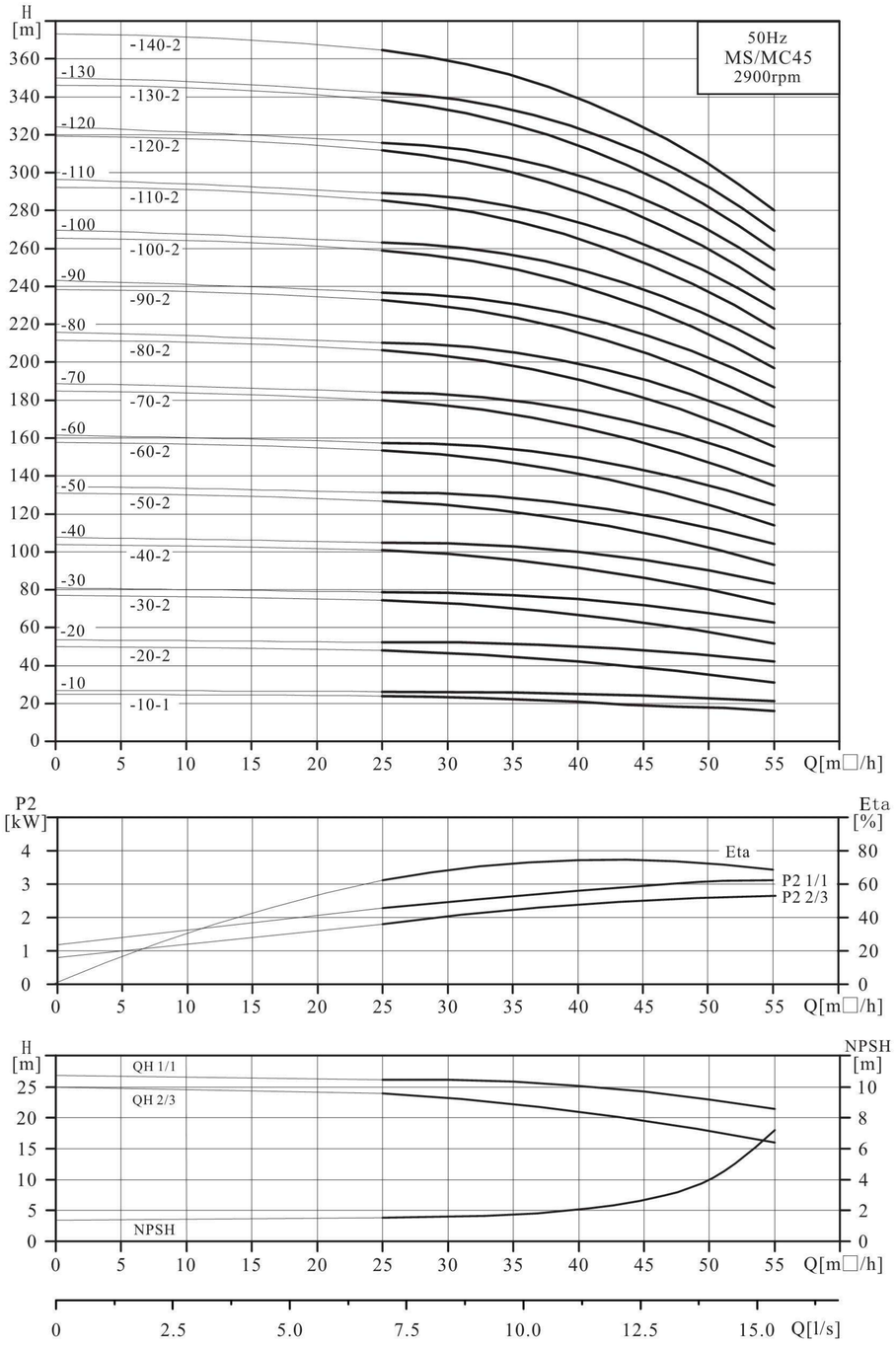


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS45-10-1	511	410	921	230	185	84
MS45-10	511	465	976	260	210	108
MS45-20-2	591	465	1056	260	210	118
MS45-20	696	610	1306	350	260	174
MS45-30-2	776	610	1386	350	260	177
MS45-30	776	610	1386	350	260	186
MS45-40-2	856	640	1496	350	260	210
MS45-40	856	640	1496	350	260	210
MS45-50-2	936	640	1576	350	260	213
MS45-50	936	670	1606	360	285	247
MS45-60-2	1016	715	1731	400	310	322
MS45-60	1016	715	1731	400	310	322
MS45-70-2	1096	715	1811	400	310	324
MS45-70	1096	715	1811	400	310	324
MS45-80-2	1176	715	1891	400	310	341
MS45-80	1176	715	1891	400	310	341
MS45-90-2	1256	715	1971	400	310	344
MS45-90	1256	715	1971	400	310	344
MS45-100-2	1336	740	2076	460	340	417
MS45-100	1336	740	2076	460	340	418
MS45-110-2	1416	740	2156	460	340	420
MS45-110	1416	740	2156	460	340	420
MS45-120-2	1526	820	2346	550	370	527
MS45-120	1526	820	2346	550	370	527
MS45-130-2	1606	820	2426	550	370	529
MS45-130	1606	820	2426	550	370	529
MS45-140-2	1686	820	2506	550	370	532

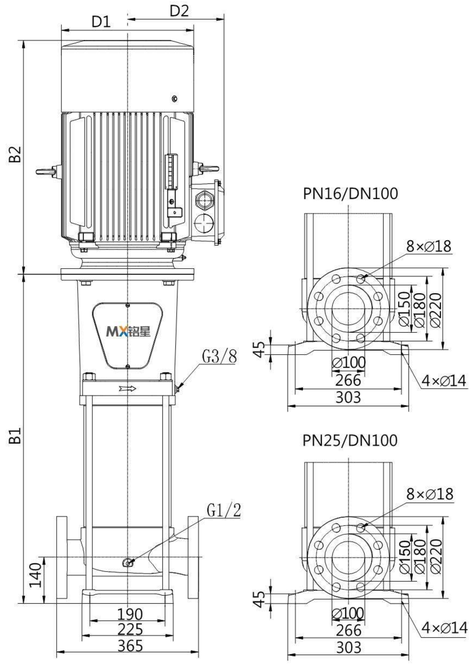
Operational performance data

Model	Auxiliary motor (kW)	Q (m^3/h)	25	30	35	40	45	50	55
MS45-10-1	4	H (m)	24	23	22	21	19	18	16
MS45-10	5.5		26.5	26	25.5	25	23.5	22	21
MS45-20-2	7.5		48	46	44	42	39	35	31
MS45-20	11		53	52	51	49	48	45	41
MS45-30-2	11		74	72	69	67	63	57	52
MS45-30	15		79	78	76	74	71	67	62
MS45-40-2	18.5		101	98	95	91	87	80	72
MS45-40	18.5		105	104	102	99	95	90	83
MS45-50-2	18.5		127	124	120	116	110	102	93
MS45-50	22		132	130	127	124	119	112	104
MS45-60-2	30		153	150	146	141	134	125	114
MS45-60	30		158	156	153	148	143	134	124
MS45-70-2	30		180	176	171	166	158	147	135
MS45-70	30		184	182	178	173	166	157	145
MS45-80-2	37		206	202	197	190	182	169	155
MS45-80	37		210	208	204	198	190	179	166
MS45-90-2	37		232	228	222	215	205	192	176
MS45-90	37		237	234	229	222	214	202	186
MS45-100-2	45		258	254	248	240	229	214	197
MS45-100	45		263	260	255	247	238	224	207
MS45-110-2	45		285	280	273	264	253	237	217
MS45-110	45		289	285	280	272	261	246	228
MS45-120-2	55		311	306	299	289	277	259	238
MS45-120	55		316	311	305	296	285	269	248
MS45-130-2	55		337	331	324	314	300	281	259
MS45-130	55		342	337	331	321	309	291	269
MS45-140-2	55		364	357	349	338	324	304	279

Performance curve



Mounting dimensions and weight

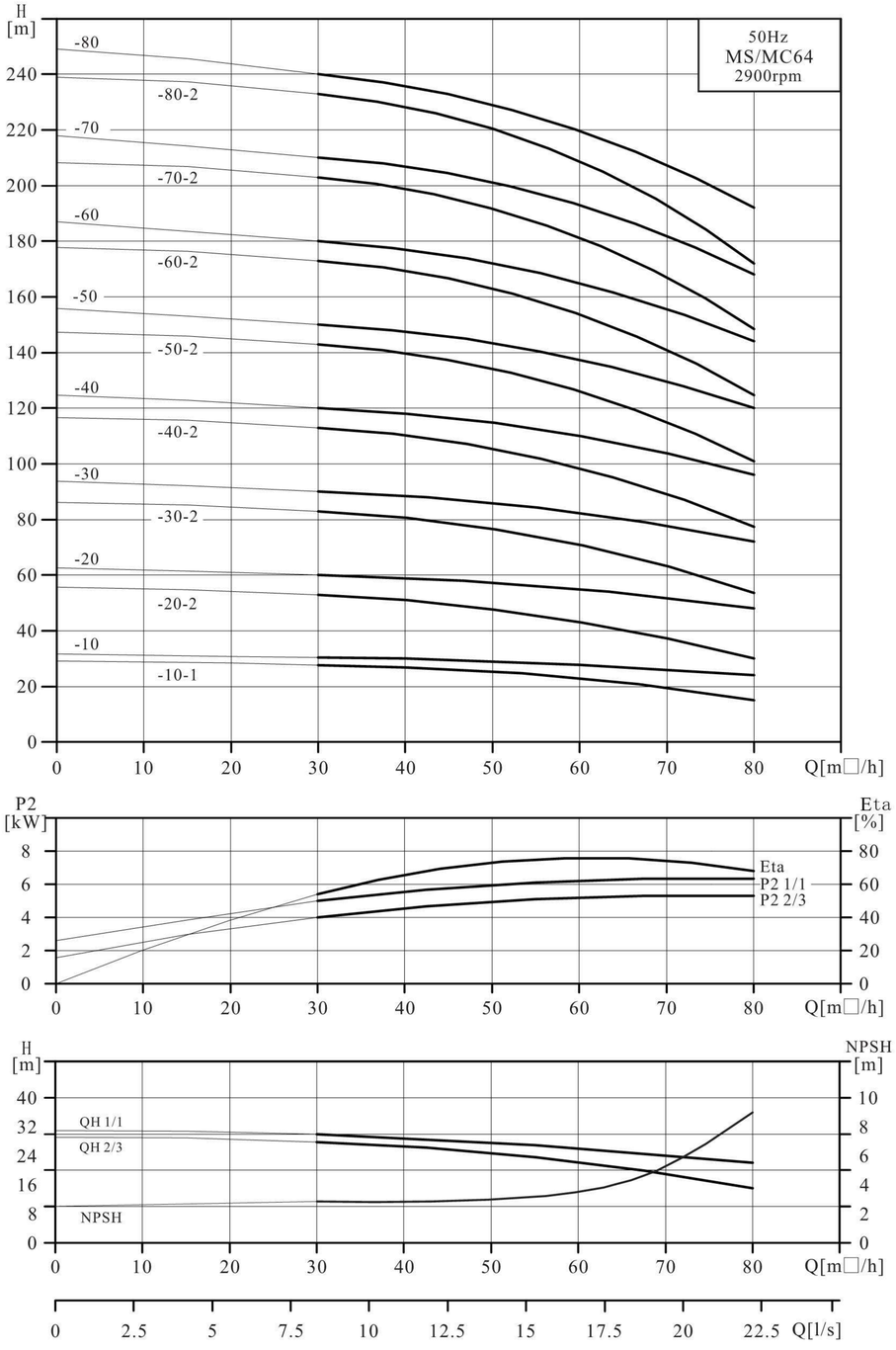


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS64-10-1	514	465	979	260	210	110
MS64-10	514	465	979	260	210	120
MS64-20-2	702	610	1312	350	260	177
MS64-20	702	610	1312	350	260	184
MS64-30-2	785	640	1425	350	260	209
MS64-30	785	670	1455	360	285	243
MS64-40-2	868	715	1583	400	310	318
MS64-40	868	715	1583	400	310	318
MS64-50-2	951	715	1666	400	310	335
MS64-50	951	715	1666	400	310	335
MS64-60-2	1034	740	1774	460	340	409
MS64-60	1034	740	1774	460	340	409
MS64-70-2	1147	820	1967	550	370	516
MS64-70	1147	820	1967	550	370	516
MS64-80-2	1230	820	2050	550	370	519
MS64-80	1230	820	2050	550	370	519

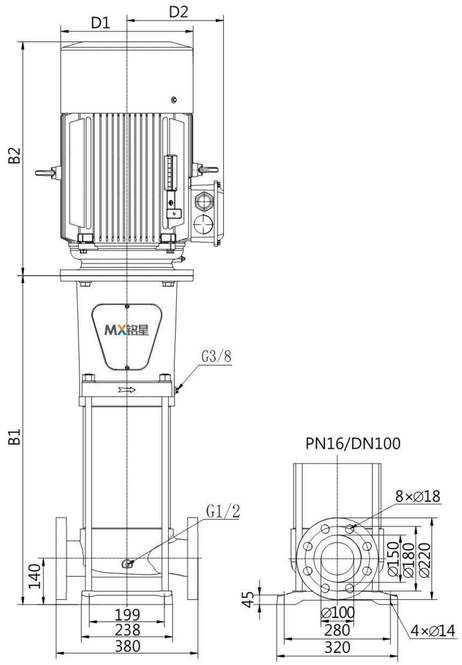
Operational performance data

Model	Auxiliary motor（kW）	Q（m³/h）	30	40	50	60	64	70	80
MS64-10-1	5.5	H（m）	27	25	23	21	20	18	15
MS64-10	7.5		30	29.5	29	28	27	26	24
MS64-20-2	11		53	51	47	43	41	37	30
MS64-20	15		60	59	58	55	54	52	48
MS64-30-2	18.5		83	81	76	71	68	63	54
MS64-30	22		90	89	86	83	81	78	72
MS64-40-2	30		113	110	105	98	95	89	78
MS64-40	30		120	119	115	110	108	104	96
MS64-50-2	37		143	140	133	126	122	115	102
MS64-50	37		150	148	144	138	135	130	120
MS64-60-2	45		173	170	162	153	149	141	126
MS64-60	45		180	178	173	165	162	156	144
MS64-70-2	55		203	199	191	181	176	167	150
MS64-70	55		210	207	201	193	189	182	168
MS64-80-2	55		233	229	220	208	203	193	174
MS64-80	55		240	237	230	220	216	208	192

Performance curve



Mounting dimensions and weight

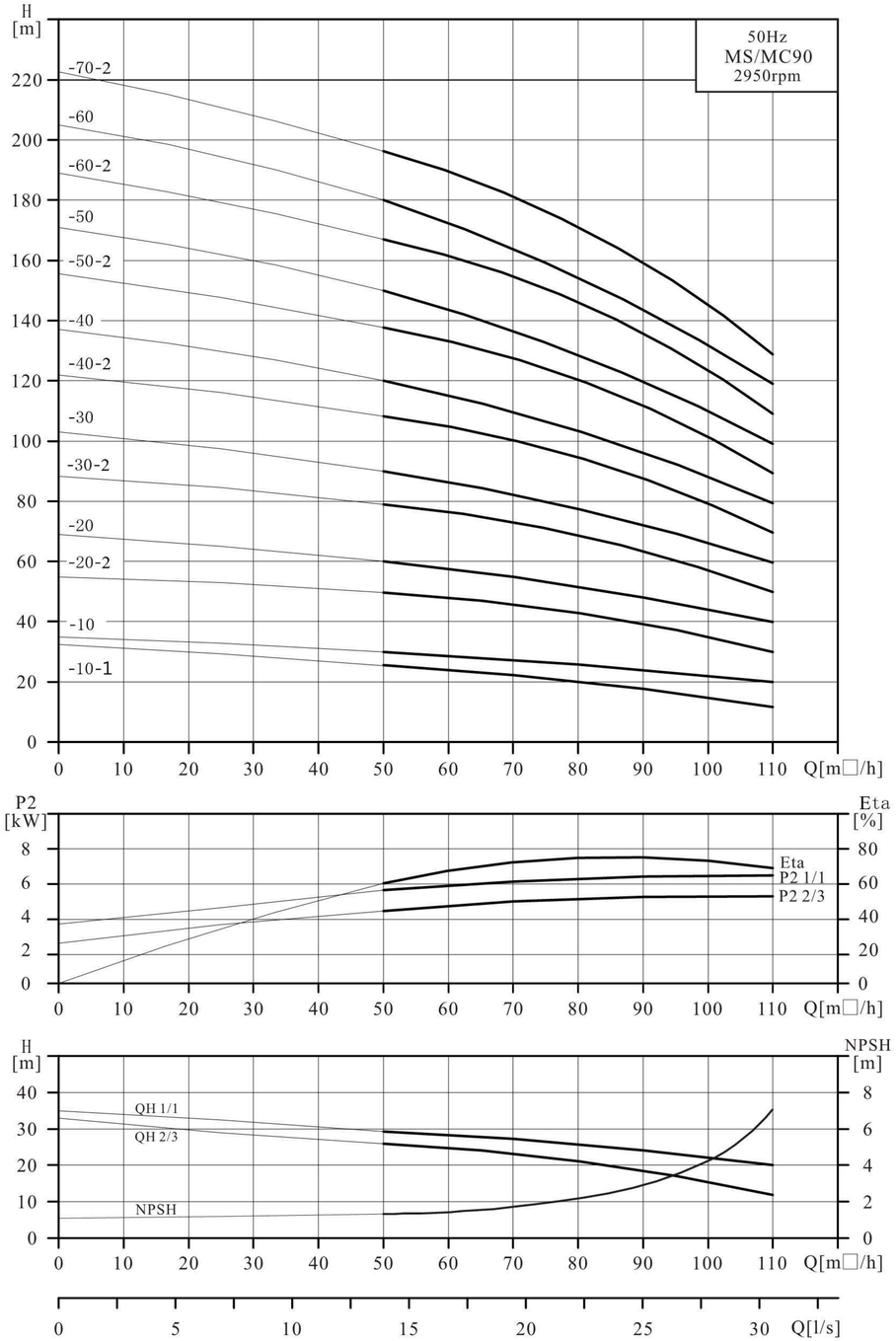


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS90-10-1	523	465	988	260	210	125
MS90-10	628	610	1238	350	260	179
MS90-20-2	720	610	1330	350	260	189
MS90-20	720	640	1360	350	260	217
MS90-30-2	812	670	1482	360	285	248
MS90-30	812	715	1527	400	310	319
MS90-40-2	904	715	1619	400	310	322
MS90-40	904	715	1619	400	310	336
MS90-50-2	996	740	1736	460	340	412
MS90-50	996	740	1736	460	340	412
MS90-60-2	1118	820	1938	550	370	519
MS90-60	1118	820	1938	550	370	519
MS90-70-2	1210	820	2030	550	370	522

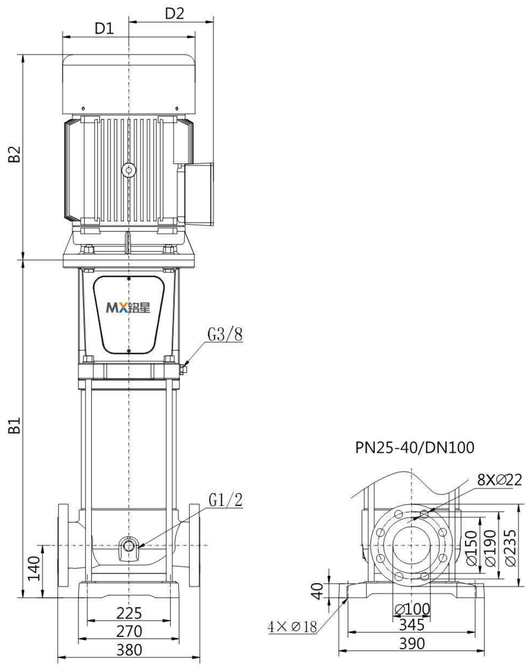
Operational performance data

Model	Auxiliary motor (kW)	Q (m³/h)	50	60	70	80	90	100	110
MS90-10-1	7.5	H (m)	25	24	22	21	19	16	12
MS90-10	11		29	28	27	26	24	22	20
MS90-20-2	15		53	50	47	44	40	36	30
MS90-20	18.5		58	56	55	51	48	44	39
MS90-30-2	22		82	78	74	70	64	58	50
MS90-30	30		87	84	82	77	72	66	59
MS90-40-2	30		111	106	102	95	88	80	69
MS90-40	37		116	112	109	103	96	88	79
MS90-50-2	45		140	134	129	121	112	102	89
MS90-50	45		145	140	137	128	120	110	98
MS90-60-2	55		169	162	156	147	136	124	109
MS90-60	55		174	168	164	154	144	132	118
MS90-70-2	55		198	190	184	172	160	146	128

Performance curve



Mounting dimensions and weight

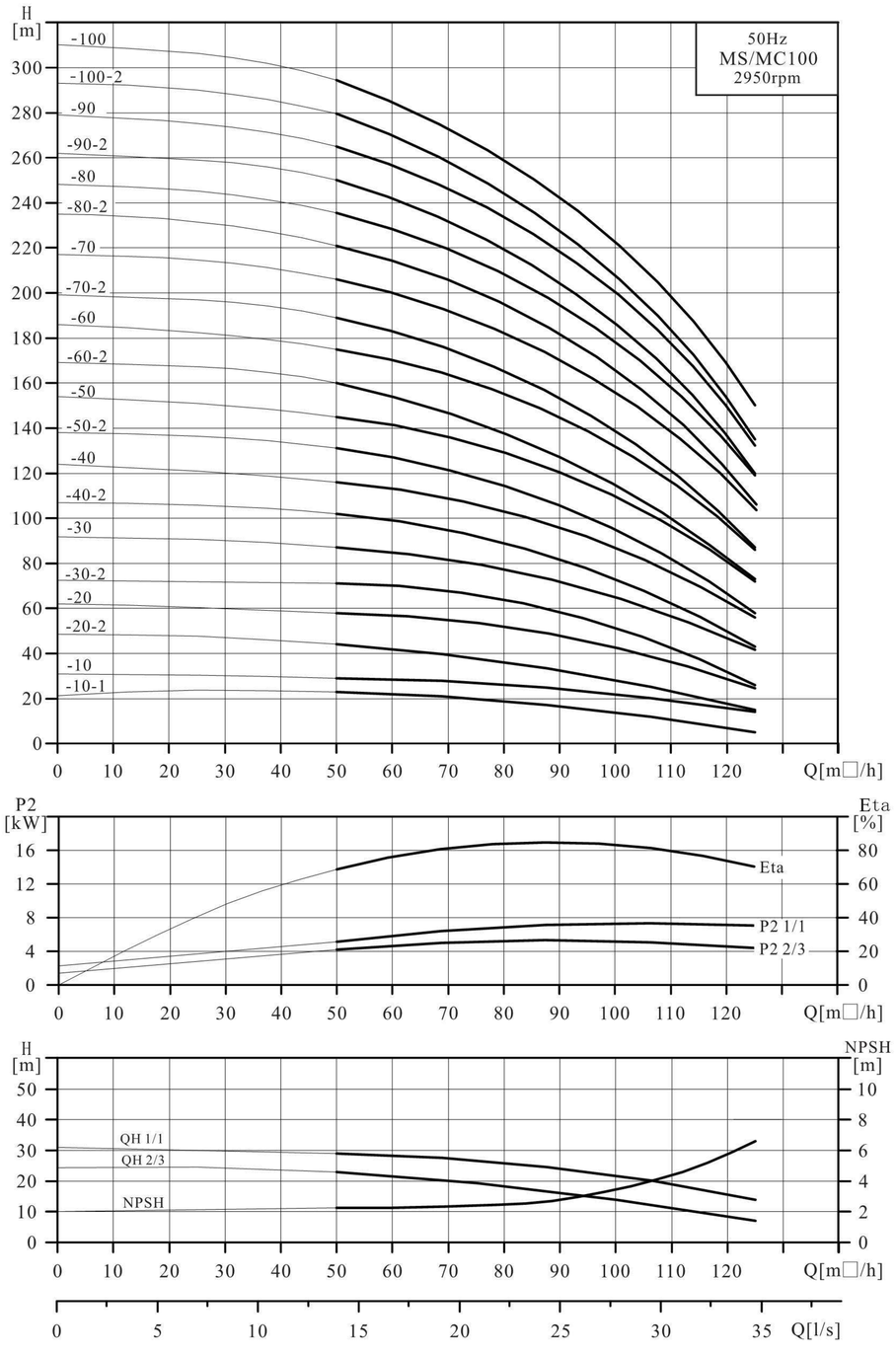


Model	size (mm)					weight (kg)
	B1	B2	B1+B2	D1	D2	
MS100-10-1	593	465	1058	260	210	120
MS100-10	593	465	1058	260	210	127
MS100-20-2	798	610	1408	350	260	188
MS100-20	798	610	1408	350	260	195
MS100-30-2	902	640	1542	360	285	223
MS100-30	902	670	1572	360	285	256
MS100-40-2	1007	715	1722	400	310	332
MS100-40	1007	715	1722	400	310	332
MS100-50-2	1111	715	1826	400	310	351
MS100-50	1111	715	1826	400	310	351
MS100-60-2	1216	740	1956	460	340	431
MS100-60	1216	740	1956	460	340	431
MS100-70-2	1350	820	2170	550	370	540
MS100-70	1350	820	2170	550	370	540
MS100-80-2	1485	820	2305	550	370	545
MS100-80	1485	870	2355	580	410	660
MS100-90-2	1590	870	2460	580	410	665
MS100-90	1590	870	2460	580	410	665
MS100-100-2	1695	870	2565	580	410	671
MS100-100	1695	870	2565	580	410	671

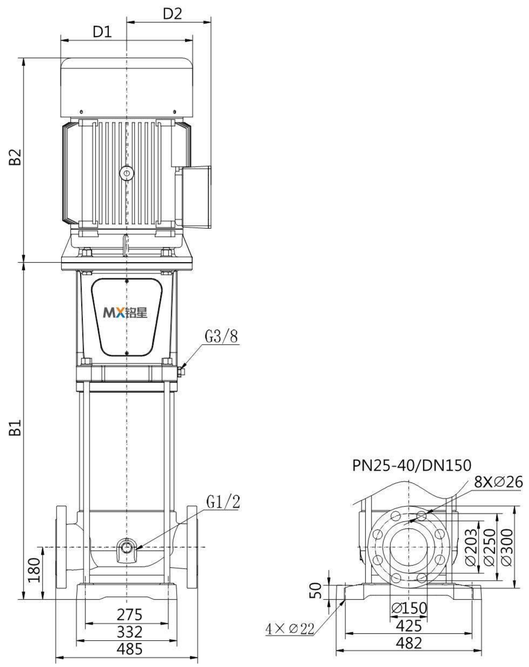
Operational performance data

Model	Auxiliary motor (kW)	Q (m³/h)	50	60	70	80	90	100	110	120	125
MS100-10-1	5. 5	H (m)	23	22	20	18	16	14	11	8	7
MS100-10	7. 5		29	28	27	26	24	22	18	16	14
MS100-20-2	11		44	43	41	38	34	28	23	17	15
MS100-20	15		58	56	54	52	49	43	37	31	28
MS100-30-2	18. 5		71	68	66	62	57	52	42	31	26
MS100-30	22		87	84	81	78	73	65	56	48	43
MS100-40-2	30		102	99	95	90	83	71	60	48	43
MS100-40	30		116	113	109	104	97	87	76	64	58
MS100-50-2	37		131	127	122	116	107	93	79	65	58
MS100-50	37		145	141	136	130	122	109	96	80	72
MS100-60-2	45		160	156	150	142	131	115	99	81	73
MS100-60	45		175	170	164	157	146	132	115	96	89
MS100-70-2	55		189	184	177	168	156	137	119	97	87
MS100-70	55		206	202	193	183	172	156	138	114	105
MS100-80-2	55		221	215	207	197	182	165	142	115	103
MS100-80	75		235	231	221	209	197	178	158	130	120
MS100-90-2	75		250	245	234	221	206	184	161	131	120
MS100-90	75		265	260	248	235	221	201	177	147	135
MS100-100-2	75		279	274	262	247	231	206	181	147	135
MS100-100	75		294	289	279	261	246	223	197	163	150

Performance curve



Mounting dimensions and weight

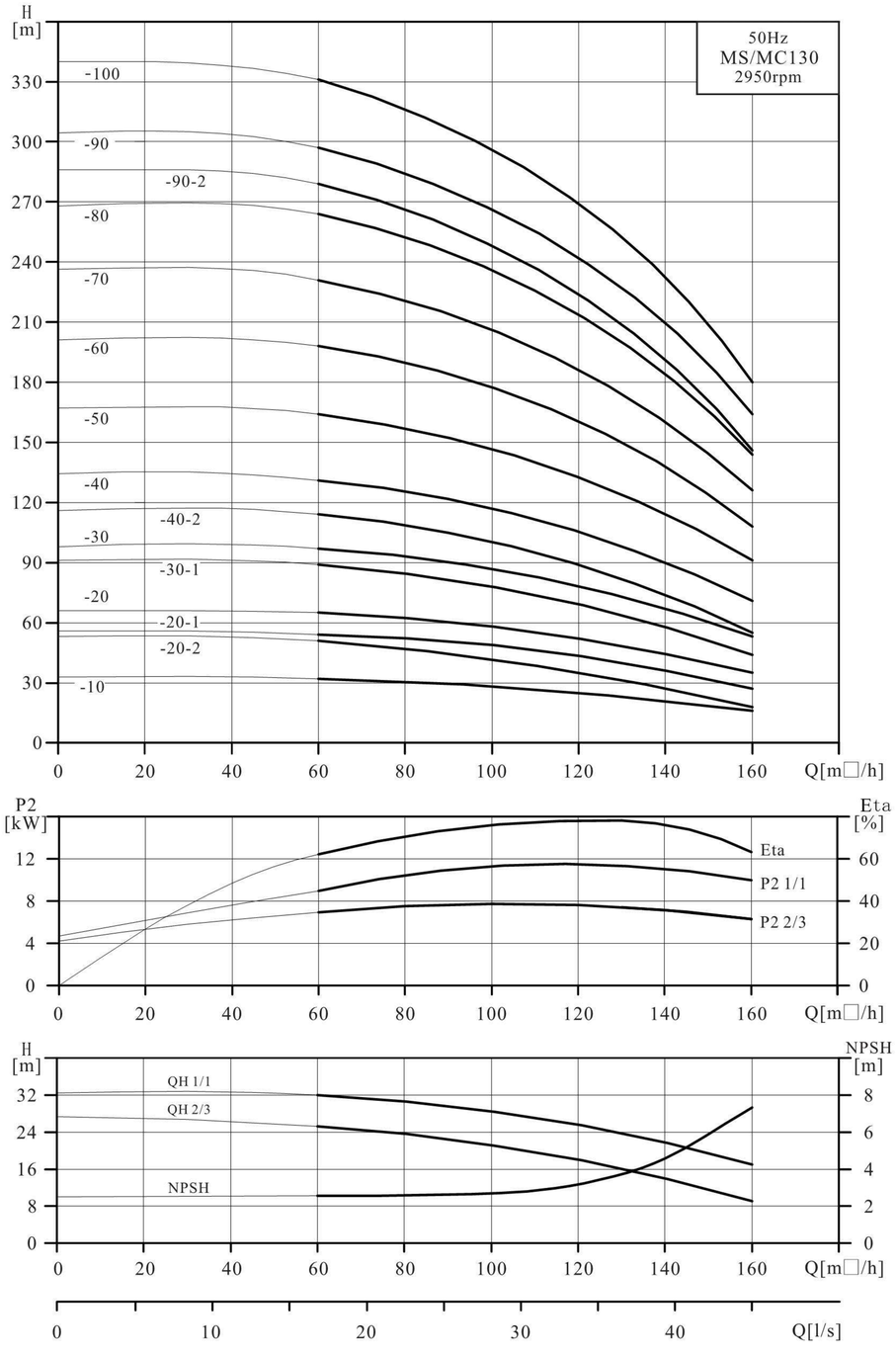


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS130-10	787	610	1397	350	260	222
MS130-20-2	909	610	1519	350	260	238
MS130-20-1	909	640	1549	360	285	260
MS130-20	909	670	1579	360	285	292
MS130-30-1	1031	715	1746	400	310	371
MS130-30	1031	715	1746	400	310	385
MS130-40-2	1153	715	1868	400	310	394
MS130-40	1153	740	1893	460	340	465
MS130-50	1375	820	2195	550	370	581
MS130-60	1497	870	2367	580	410	704
MS130-70	1619	870	2489	580	410	713
MS130-80	1741	920	2661	580	410	768
MS130-90-2	1863	920	2783	580	410	778
MS130-90	1863	1060	2923	660	550	1169
MS130-100	1985	1060	3045	660	550	1178

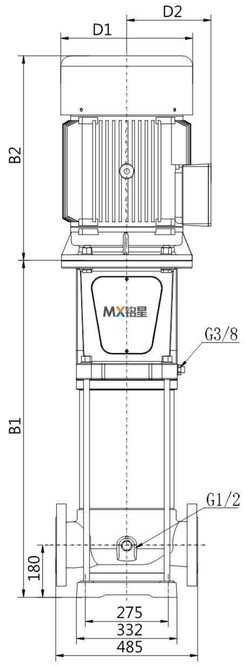
Operational performance data

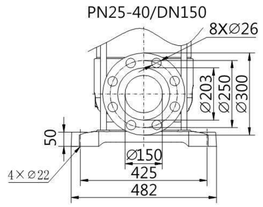
Model	Auxiliary motor（kW）	Q (m³/h)	60	70	80	90	100	110	120	130	140	150	160
MS130-10	11	H (m)	32	31	30	29	28	27	25	23	22	20	17
MS130-20-2	15		51	48	46	43	40	37	34	31	27	23	18
MS130-20-1	18.5		54	52	51	50	49	47	45	40	35	31	27
MS130-20	22		65	64	62	60	58	56	52	48	44	40	35
MS130-30-1	30		89	87	85	82	78	74	70	64	58	51	44
MS130-30	37		97	96	94	91	87	83	77	73	67	61	53
MS130-40-2	37		114	111	108	104	98	94	89	81	74	64	55
MS130-40	45		131	129	125	121	117	113	105	97	89	82	71
MS130-50	55		164	162	158	152	147	142	133	124	114	103	91
MS130-60	75		198	196	189	182	178	170	161	150	137	122	108
MS130-70	75		231	227	222	218	209	199	187	174	159	144	126
MS130-80	90		264	260	254	248	238	228	213	200	182	164	144
MS130-90-2	90		279	274	269	261	250	239	224	208	188	168	146
MS130-90	110		297	293	287	279	268	257	243	227	207	187	164
MS130-100	110		331	325	318	311	298	284	270	250	230	207	182

Performance curve



Mounting dimensions and weight



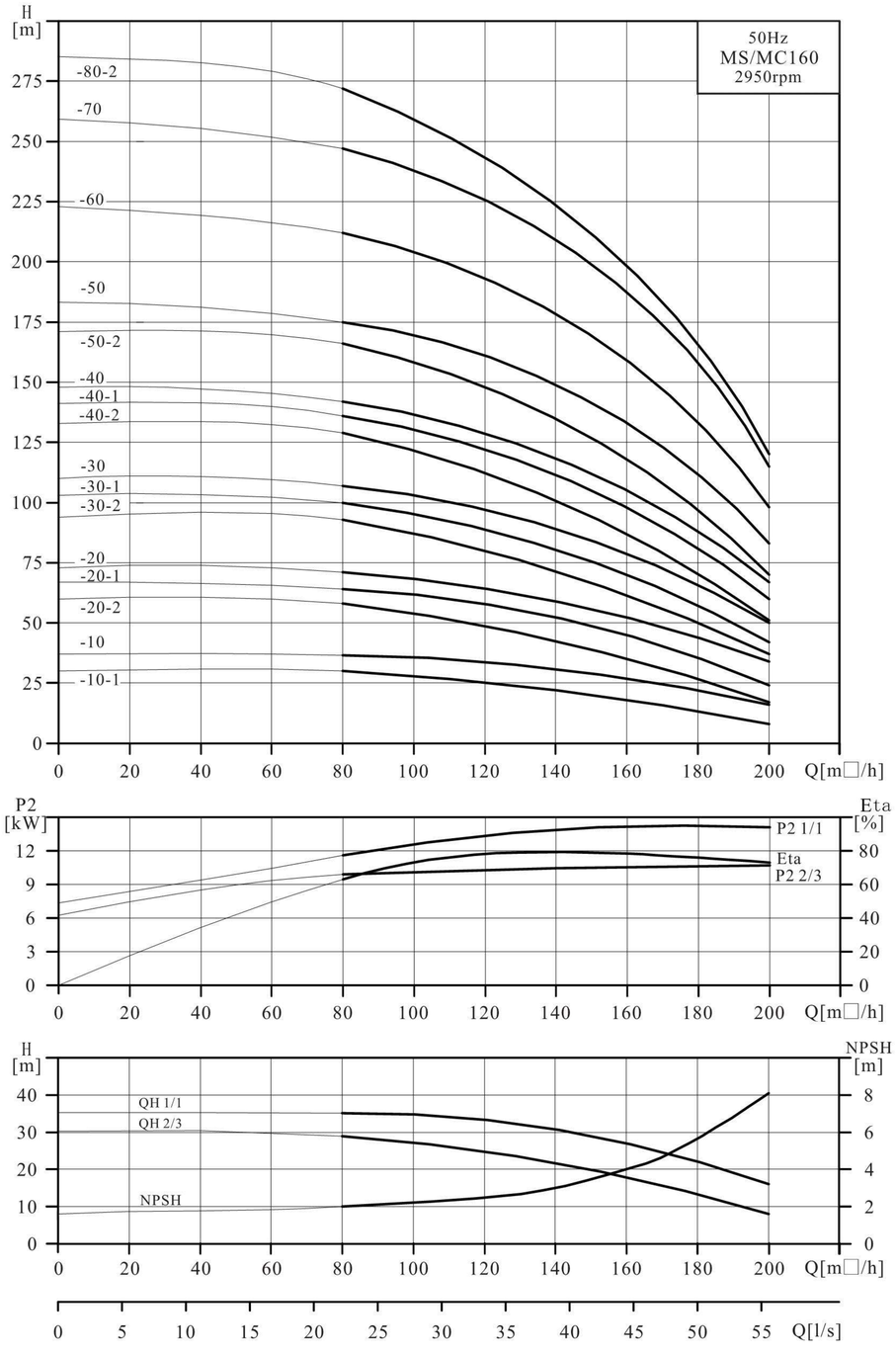


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS160-10-1	787	610	1397	350	260	222
MS160-10	787	610	1397	350	260	229
MS160-20-2	909	670	1579	360	285	292
MS160-20-1	909	715	1624	400	310	362
MS160-20	909	715	1624	400	310	362
MS160-30-2	1031	715	1746	400	310	385
MS160-30-1	1031	740	1771	460	340	457
MS160-30	1031	740	1771	460	340	457
MS160-40-2	1183	820	2003	550	370	573
MS160-40-1	1183	820	2003	550	370	573
MS160-40	1183	870	2053	580	410	682
MS160-50-2	1305	870	2175	580	410	696
MS160-50	1305	870	2175	580	410	696
MS160-60	1427	920	2347	580	410	752
MS160-70	1549	1060	2609	660	550	1152
MS160-80-2	1671	1060	2731	660	550	1161

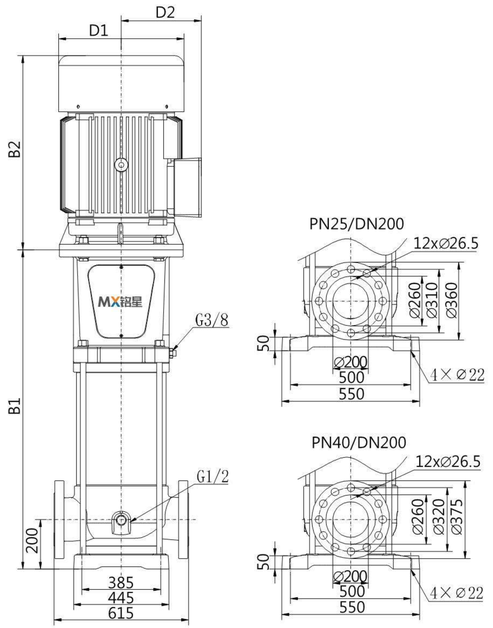
Operational performance data

Model	Auxiliary motor（kW）	Q (m^3/h)	80	90	100	110	120	130	140	150	160	170	180	190	200
MS160-10-1	11		29	28	27	26	25	23	21	20	18	16	14	11	8
MS160-10	15		35	34	33	32	31	30	29	28	27	24	21	19	16
MS160-20-2	22		58	56	54	51	48	45	42	39	35	31	27	22	17
MS160-20-1	30		64	62	60	58	56	53	50	48	45	40	35	30	24
MS160-20	30		71	68	67	66	64	61	58	55	52	48	44	39	34
MS160-30-2	37		93	91	89	85	81	77	72	67	61	55	49	43	37
MS160-30-1	45	H (m)	100	96	94	92	89	84	79	75	70	64	58	50	42
MS160-30	45		107	103	101	99	96	93	90	85	79	73	66	58	50
MS160-40-2	55		129	124	121	117	112	106	100	94	87	79	71	61	51
MS160-40-1	55		136	133	130	126	122	117	112	105	98	90	81	70	60
MS160-40	75		142	137	134	131	128	123	118	112	105	97	88	78	67
MS160-50-2	75		166	163	159	154	148	142	135	127	118	108	96	83	70
MS160-50	75		175	173	171	168	164	158	151	142	133	122	111	97	83
MS160-60	90		212	209	205	201	196	190	181	171	159	147	133	115	98
MS160-70	110		247	244	241	236	231	222	212	200	188	171	154	135	115
MS160-80-2	110		272	267	262	256	249	238	226	213	198	180	161	141	120

Performance curve



Mounting dimensions and weight

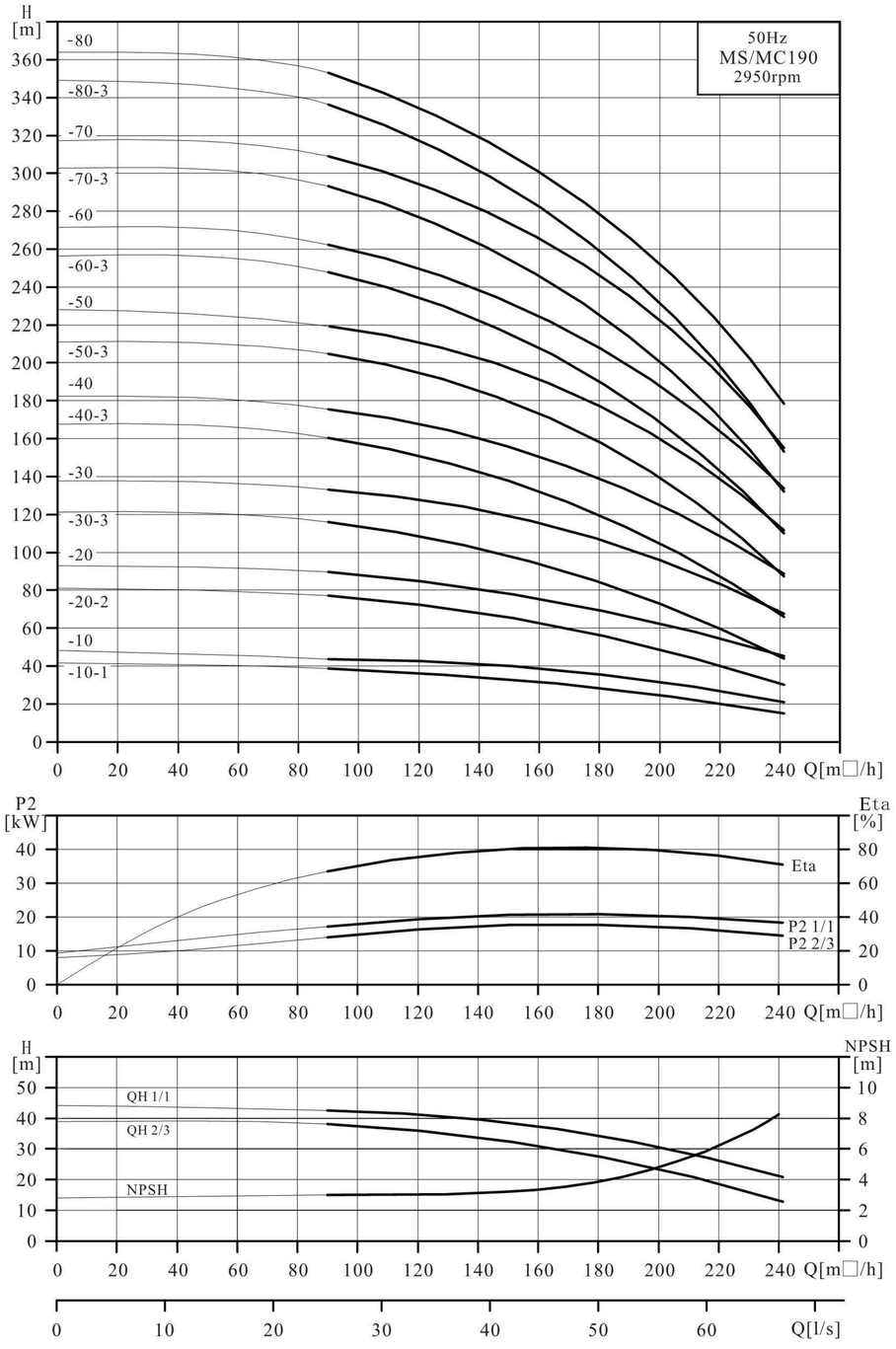


Model	size（mm）					weight（kg）
	B1	B2	B1+B2	D1	D2	
MS190-10-1	854	640	1494	350	260	316
MS190-10	854	670	1524	360	285	345
MS190-20-2	986	670	1656	360	285	441
MS190-20	1006	740	1746	460	340	513
MS190-30-3	1140	820	1960	550	370	628
MS190-30	1140	870	2010	580	410	742
MS190-40-3	1268	870	2138	580	410	756
MS190-40	1268	920	2188	580	410	804
MS190-50-3	1420	1060	2480	660	550	1210
MS190-50	1420	1060	2480	660	550	1210
MS190-60-3	1548	1225	2773	660	550	1259
MS190-60	1548	1225	2773	660	550	1259
MS190-70-3	1676	1225	2901	660	550	1333
MS190-70	1676	1225	2901	660	550	1333
MS190-80-3	1804	1380	3184	660	550	1442
MS190-80	1804	1380	3184	660	550	1442

Operational performance data

Model	Auxiliary motor（kW）	Q（m^3/h）	90	120	140	160	180	190	200	220	240
MS190-10-1	18.5	H（m）	39	37	34	32	29	27	25	20	15
MS190-10	22		45	42	39	37	35	33	31	28	23
MS190-20-2	37		76	72	68	63	57	53	48	40	31
MS190-20	45		87	83	79	74	69	66	62	55	45
MS190-30-3	55		115	109	102	95	85	79	73	60	43
MS190-30	75		132	126	120	113	105	99	94	82	68
MS190-40-3	75		159	151	142	131	119	112	105	87	66
MS190-40	90		175	168	160	151	139	131	125	110	90
MS190-50-3	110		204	193	183	171	156	147	137	116	89
MS190-50	110		219	211	202	189	175	167	157	136	113
MS190-60-3	132		248	236	224	209	190	179	167	141	112
MS190-60	132		263	253	242	228	210	199	189	164	135
MS190-70-3	160		292	279	266	248	226	212	200	169	134
MS190-70	160		308	295	283	267	246	232	220	191	156
MS190-80-3	200		336	321	306	286	260	247	231	198	155
MS190-80	200		350	338	323	305	280	267	252	218	179

Performance curve



Recommended for pump fluids

Stainless steel vertical multistage pump can solid particles or fibers of non-flammable and explosive media, MS can transport a slightly corrosive medium, MC can transport a non-corrosive medium, please refer to the appendix table for details. The table recommends some liquid preparations. Please consult our company for any details.
The content in the table is for reference only, in the actual process of selecting the pump, please note that other characteristics of the liquid, such as the density of the liquid, freezing point, viscosity and requirements for explosion protection, protection level, as well as the pressure and temperature of the environment also need to be taken into account, and can not be used as a substitute for the actual use and testing in a specific working environment.

Liquid recommendation

Transfer liquid	Liquid concentration temperature	MC(Cast iron)			MS(Stainless steel)		
		Epdm rubber (EPDM)	Fluororubber (VITON)	Nitrile butadiene rubber (NBR)	Epdm rubber (EPDM)	Fluororubber (VITON)	Nitrile butadiene rubber (NBR)
Acetic acid	5%,20℃				√		
Benzoic acid	50%,20℃					√	
Calcium hydroxide	20%,40℃				√		
Chromic acid	1%,20℃						√
Cupric sulfate	10%,50℃						√
Corn oil	100%,80℃					√	
Ethanol (alcohol)	100%,20℃		√				
Ethylene glycol	50%,50℃				√		
glycerol	50%,50℃						√
Isopropyl alcohol	100%,20℃			√			
Lactic acid	100%,20℃					√	
Methanol (lignin)	100%,20℃			√			
gasoline	80℃						√
Oxalic acid	1%,20℃				√		
Phosphoric acid	20%,20℃				√		
Potassium carbonate	20%,50℃					√	
Potassium permanganate	5%,20℃				√		
Sodium bicarbonate	10%,60℃					√	
Sodium nitrate	10%,60℃					√	
Sodium phosphate	10%,60℃					√	
Sodium sulfate	10%,60℃					√	
Citric acid	20%,50℃				√		
Salicylic acid	0.1%,20℃				√		
Sodium hydroxide	20%,50℃	√					
Ammonia liquor	30%,80℃				√		
Calcium acetate	30%,50℃					√	