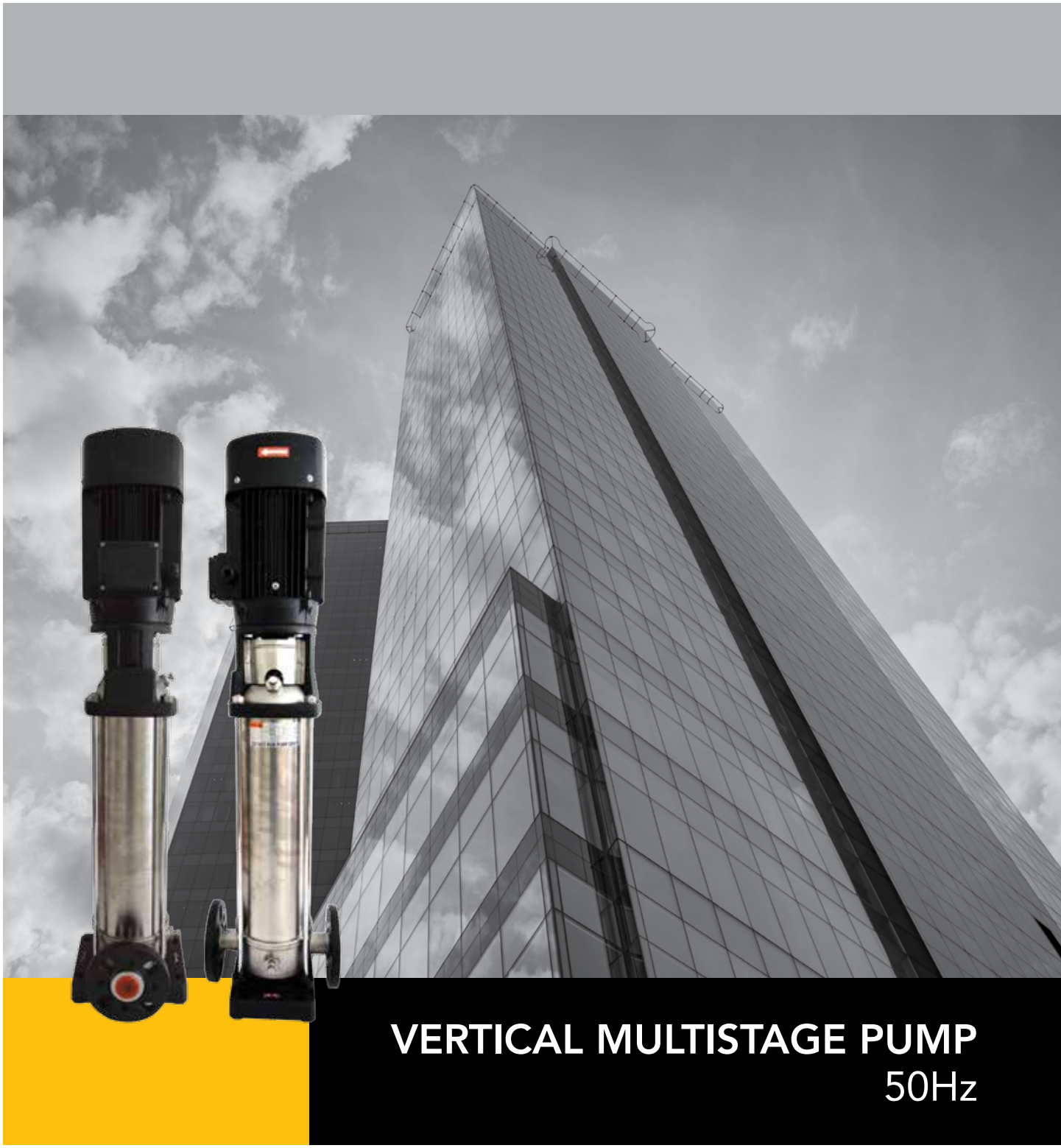
Technical Data

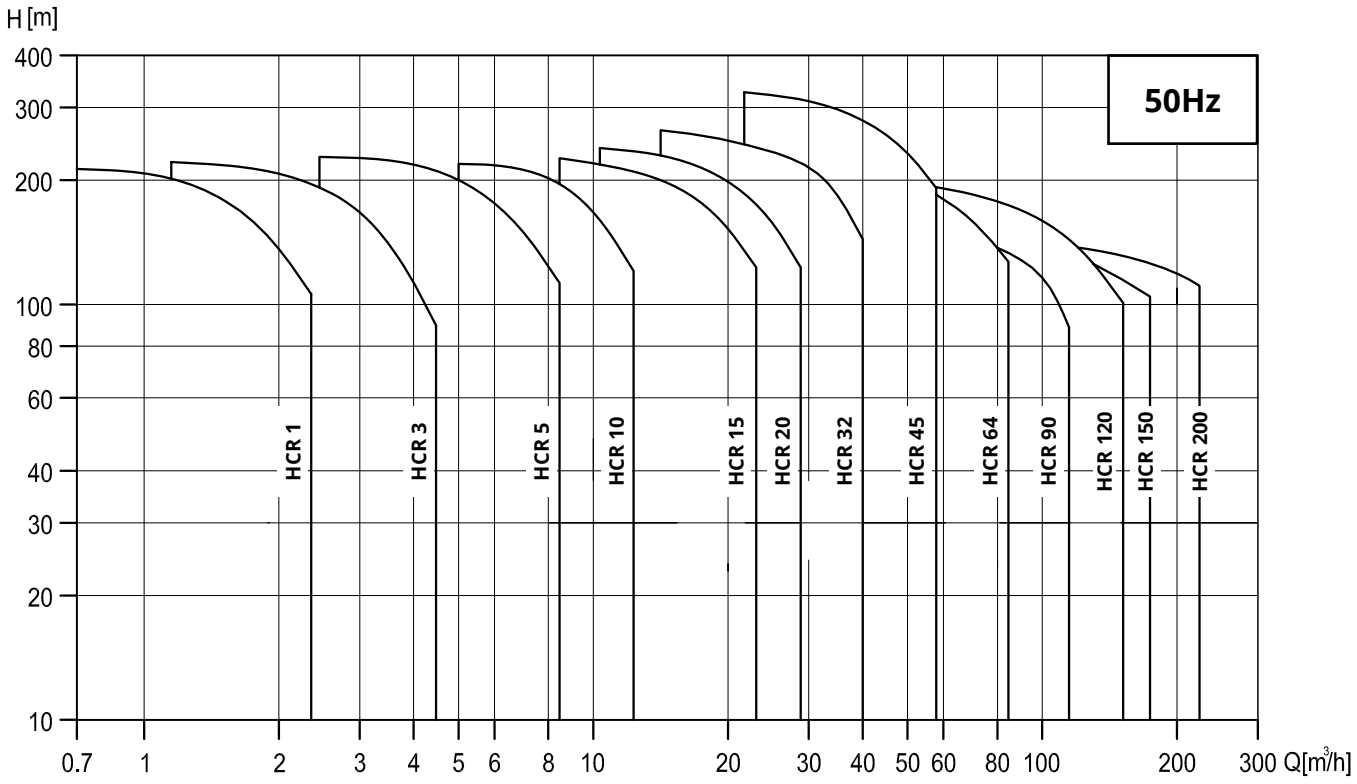


VERTICAL MULTISTAGE PUMP
50Hz

MCKARLEN

Table of Content

General Curve



General Description
HCR

HCR is a centrifugal multi-stage in-line pump suitable for a wide range of duties. This type of pump can be used for building services as well as various industrial applications.

The maximum liquid temperature of HCR pumps is 120°C. Normal temperature type is -20°C up to 70°C. It may be necessary to use a motor with a higher output power rating for the above unique application.

HCR are not self-priming pumps. Pump intake and discharge are located on the same axis, at the bottom of the pump. A standard mechanical cartridge seal in the shaft inlet separates the electric motor from the pump. The liquids must not chemically attack the pump materials. When pumping liquids with a density or viscosity which are higher than that of water, a motor with a higher output power rating shall be used.

Technical Data

- Liquid temperature:
  Normal temperature: -20°C - +70°C
  Hot watertype: -15°C - +120°C
- Flow ranges: 0.7 - 240 m^3/h
- Liquid pH value: 4 -10
- Max. ambient temperature: +50°C

Application

- The pumps could be used for transfering liquids of low viscosity, non-inflammable and non-explosive and should not contain solid particles or fibers where they could damange the pump.
- Water distribution, transfer and pressure boosting for building services, industrial and municipal waterworks.
- Backwashing and cleaning, boiler feeding, cooling water circulation, air conditioning and water treatment plants.
- Filtration systems, reverse-osmosis systems, distillation systems, separators.
- Agricultural irrigation, sprinkler irrigation, drip-feed irrigation
- Swimming pools
- Food & beverage industry
- Car Washing
- Fire-fighting system

Minimum Inlet Pressure - NPSHa

The following condition should be taken into account when calculating the inlet pressure represented by the letter "H":

The high temperature of the liquid.
Significantly higher flow than the rated flow.
Liquid is drawn from depths.
Liquid is drawn through long pipes.
The poor conditions of Inlets.

Make sure that there is a minimum pressure on the suction side of the pump to avoid cavitation. Please follow the notes bellow to calculate the maximum suction lift "H" in meters head:

H = P_b x 10.2-$NPSH_r$-H_f-H_v-H_s

P_b = Barometric pressure in bar. (Barometric pressure can be set to 1 bar). In closed systems, P_b indicates the system pressure in bar.

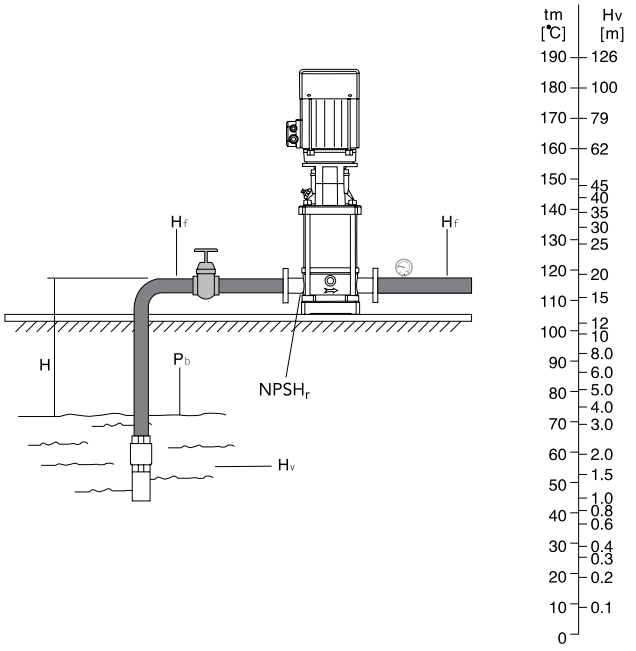
$NPSH_r$ = Net Positive Suction Head in meters head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)

H_f = Friction loss in suction pipe in meters head. (At the highest flow the pump will be delivering.)

H_v = Vapor pressure in meters head. (To be read from the vapor pressure scale. "Hv" depends on the liquid temperature "tm")

H_s = Safety margin=minimum 0.5 meters head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" meters head.
If the "H" calculated is negative, an inlet pressure of minimum "H" meters head is required.



Maximum Inlet Pressure

Bellow is the table that shows the maximum permissible inlet pressure. Please note that the current inlet pressure + the pressure against a closed valve must always be lower than the Max. permissible operating pressure.

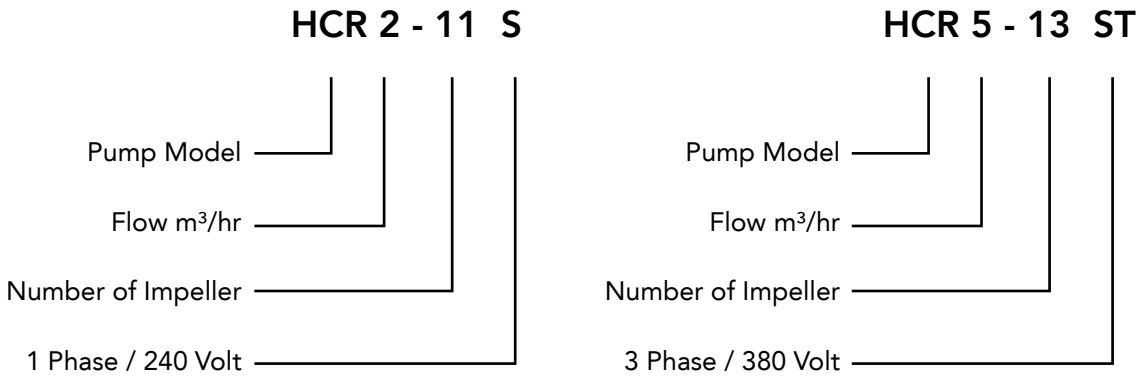
Should the maximum permissible operating pressure exceeds, the bearing in the motor may be damaged and reduces the life of the shaft seal.

Pump Type	Maximum Inlet Pressure [bar]
HCR1-2 — HCR1-36	10
HCR3-2 — HCR3-29 HCR3-31 — HCR3-36	10 15
HCR5-2 — HCR5-16 HCR5-18 — HCR5-36	10 15
HCR10-1 — HCR10-6 HCR10-7 — HCR10-22	8 10
HCR15-1 — HCR15-3 HCR15-4 — HCR15-17	8 10
HCR20-1 — HCR20-3 HCR20-4 — HCR20-17	8 10
HCR32-1-1 — HCR32-4 HCR32-5-2 — HCR32-10 HCR32-11-2 — HCR32-14	4 10 15
HCR45-1-1 — HCR45-2 HCR45-3-2 — HCR45-5 HCR45-6-2 — HCR45-13-2	4 10 15
HCR64-1-1 — HCR64-2-2 HCR64-2-1 — HCR64-4-2 HCR64-4-1 — HCR64-8-1	4 10 15
HCR90-1-1 — HCR90-1 HCR90-2-1 — HCR90-2-2 HCR90-3 — HCR90-6	4 10 15
HCR120-1 — HCR120-2-1 HCR120-2 — HCR120-5-1 HCR120-6-1 — HCR120-7	10 15 20
HCR150-1-1 — HCR150-1 HCR150-2-1 — HCR150-4-1 HCR150-5-2 — HCR150-6	10 15 20
HCR200-1-B — HCR200-1 HCR200-2-B — HCR200-3 HCR200-4-2B — HCR200-4	10 15 20

Pump range

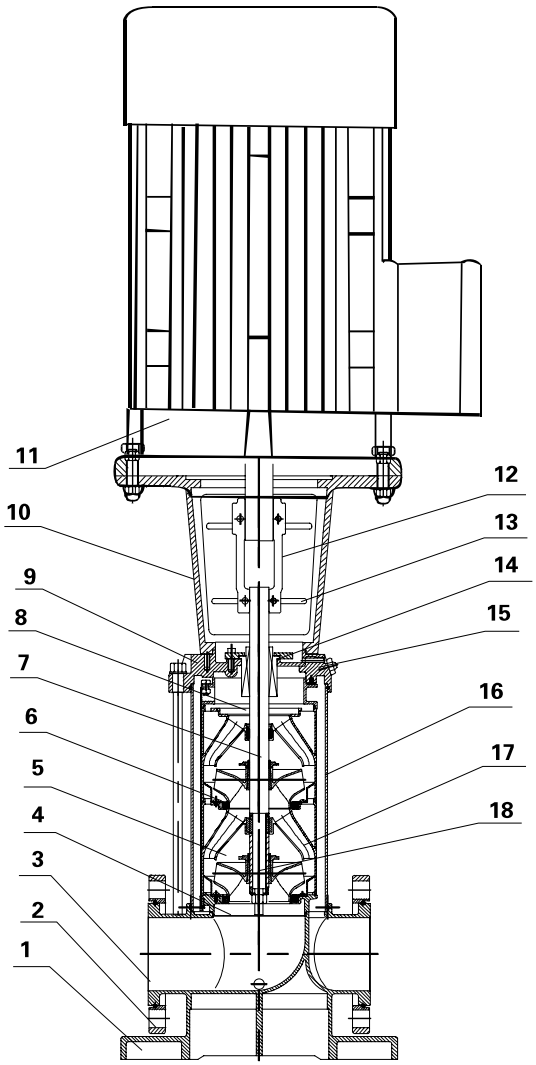
Description	HCR2	HCR3	HCR5	HCR10	HCR15	HCR20	HCR32	HCR45	HCR64	HCR90	HCR120	HCR150	HCR200
Nominal Flow [L/s]	0.028	0.083	0.139	0.278	0.417	0.556	0.890	1.251	1.779	2.502	3.333	4.166	5.555
Nominal Flow [L/min]	16.67	50.01	83.35	166.70	250.05	333.40	533.44	750.15	1066.88	1500.30	2000	2500	3333.33
Nominal Flow [m³/h]	1	3	5	10	15	20	32	45	64	90	120	150	200
Flow Range [m³/h]	0.7-2.4	1.2-4.5	2.5-8.5	5-13	8-23	10.5-29	15-40	22-58	30-85	45-120	60-160	75-180	85-240
Maximum Head [bar]	22	24	24	22	23	25	28	33	22	20	20.5	19	18
Motor Power	0.37-2.2	0,37-3	0.37-4	1.1-7.5	1.1-15	1.1-18.5	1.5-30	3-45	4-45	5.5-45	11-75	11-75	18.5-110
Pump Efficiency	45	55	60	65	70	72	78	79	80	81	75	70	80
DIN Flange	DN25	DN25	DN32	DN40	DN50	DN50	DN65	DN80	DN100	DN100	DN125	DN125	DN125
Temperature	-15°C -/+ 120°C												
Insulation Class	F												
Protection Class	IP55												
Ambient Temperature	40°C												

Type key

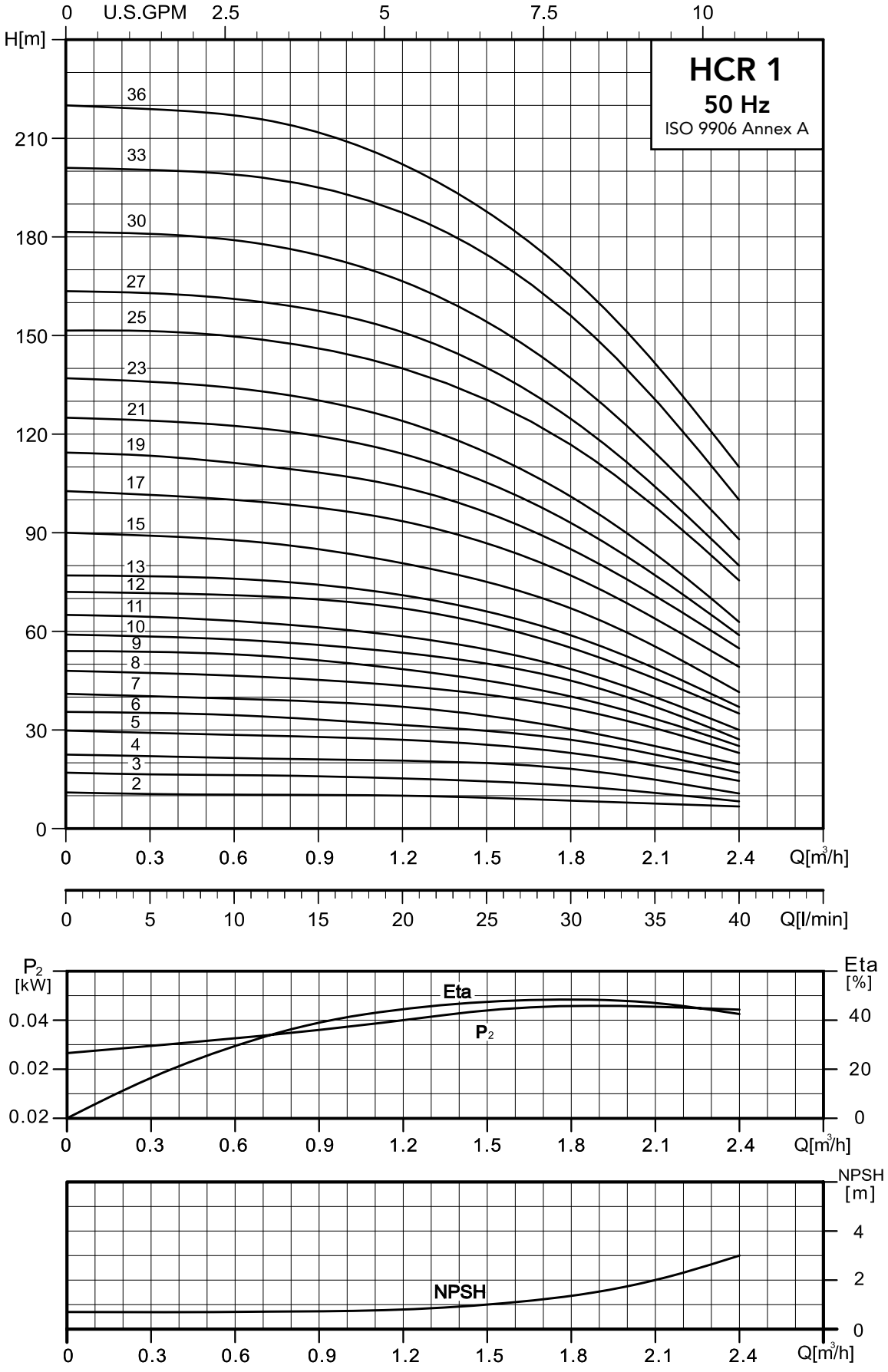


Material Specification

	Part	Material
1	Base plate	HT200
2	Flange	ZG35
3	Inlet & Outlet	AISI304
4	Primary diffuser	AISI304
5	Medium diffuser	AISI304
6	Diffuser with bearing	AISI304
7	Impeller	AISI304
8	Final diffuser	AISI304
9	Pump head	HT200
10	Motor base	HT200
11	Motor	
12	Coupling	QT400
13	Guarding plate	AISI304
14	Cartridge seal	
15	Filling plug	AISI304
16	Tension plate	AISI304
17	Pump barrel	AISI304
18	Pump shaft	AISI304



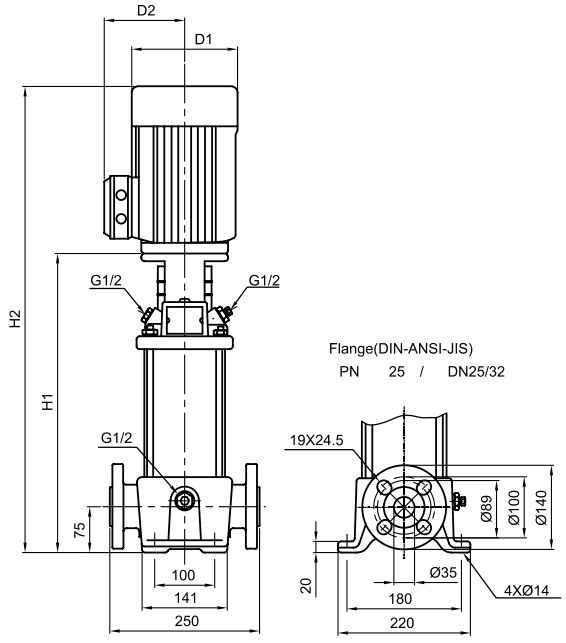
Performance Curve
HCR 1



MCKARLEN

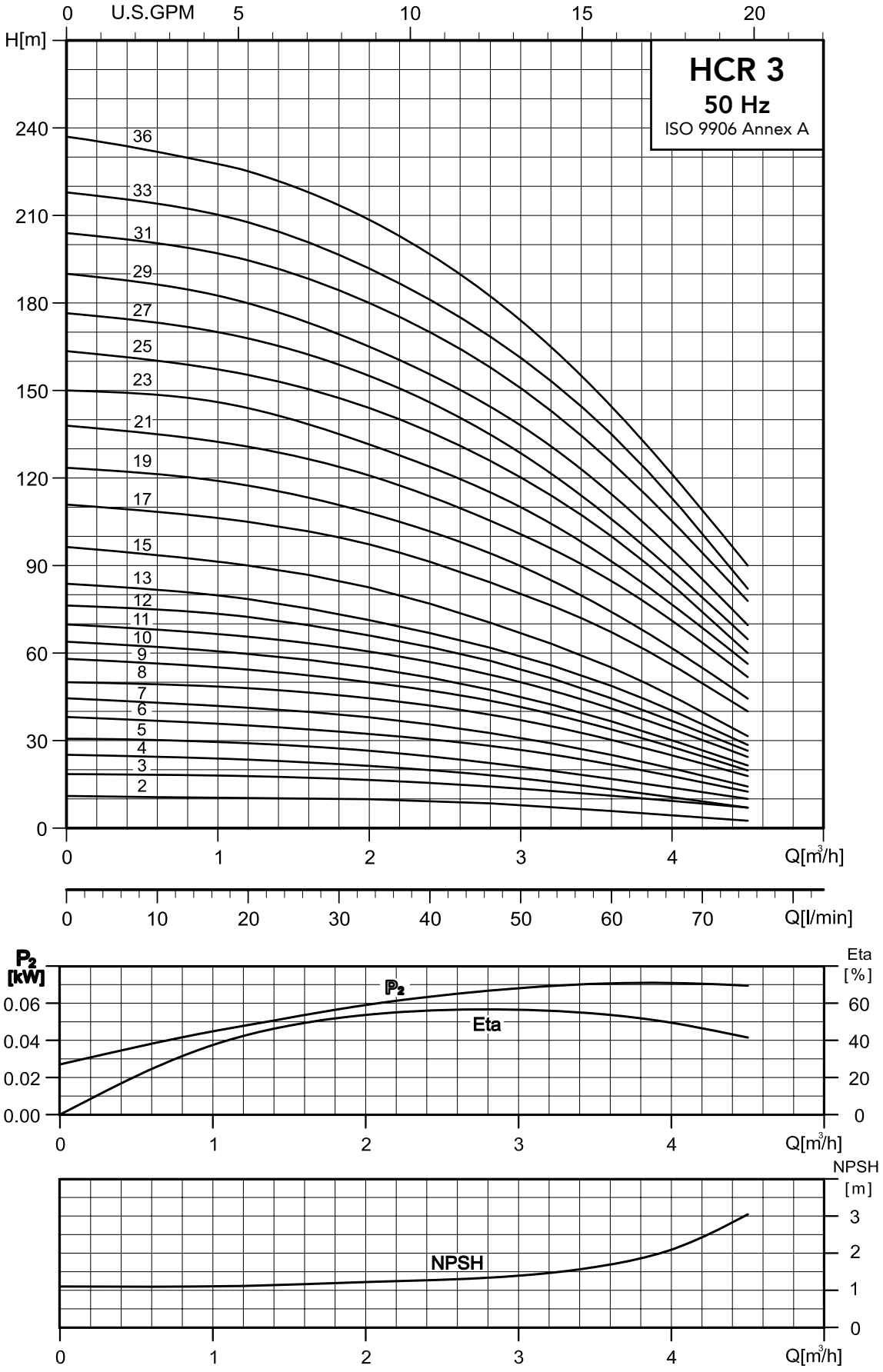
Dimensions and Weights
HCR 1

Pump type	Motor	Dimension[mm]				Net weight [kg]
	P_2	DIN flange		D1	D2	
	[kW]	H1	H2			DIN flange
HCR 1-2	0.37	279	474	141	115	23.4
HCR 1-3	0.37	279	474	141	115	23.4
HCR 1-4	0.37	297	492	141	115	23.8
HCR 1-5	0.37	315	510	141	115	24.2
HCR 1-6	0.37	333	528	141	115	24.5
HCR 1-7	0.37	351	546	141	115	24.9
HCR 1-8	0.55	369	564	141	115	25.8
HCR 1-9	0.55	387	582	141	115	26.1
HCR 1-10	0.55	405	600	141	115	26.5
HCR 1-11	0.55	423	618	141	115	26.9
HCR 1-12	0.75	447	682	141	115	29.4
HCR 1-13	0.75	465	700	141	115	29.8
HCR 1-15	0.75	501	736	141	115	30.5
HCR 1-17	1.1	537	772	141	115	32.3
HCR 1-19	1.1	573	808	141	115	33.1
HCR 1-21	1.1	609	844	141	115	33.8
HCR 1-23	1.1	645	880	141	115	34.6
HCR 1-25	1.5	697	988	177	141	44.0
HCR 1-27	1.5	733	1024	177	141	44.8
HCR 1-30	1.5	787	1078	177	141	45.9
HCR 1-33	2.2	841	1132	177	141	49.9
HCR 1-36	2.2	895	1186	177	141	51.0



MCKARLEN

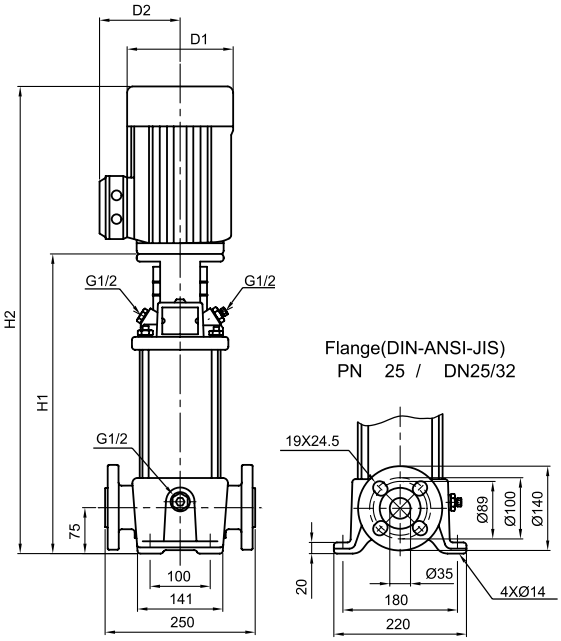
Performance Curve
HCR 3



MCKARLEN

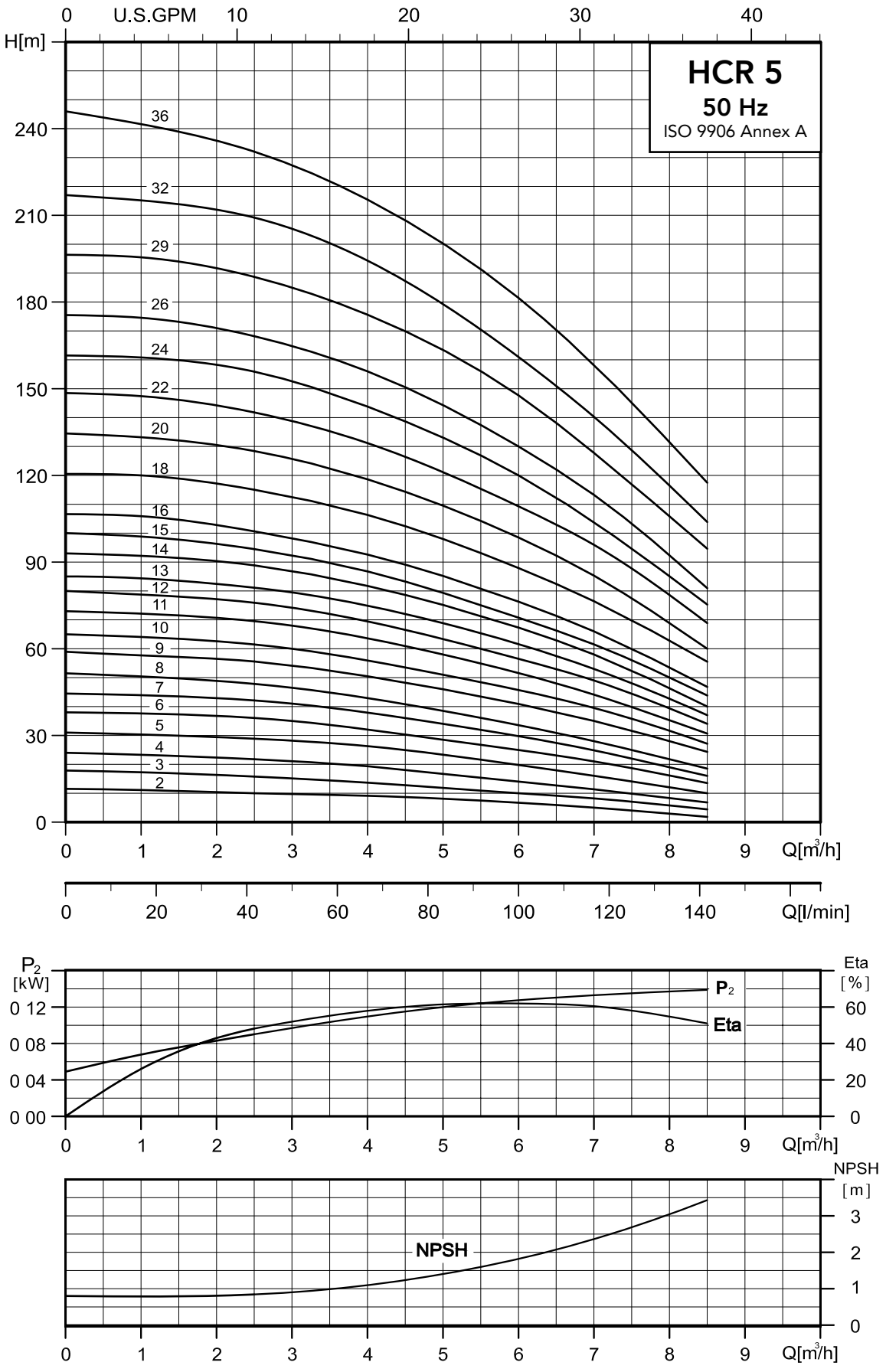
Dimensions and Weights
HCR 3

Pump type	Motor	Dimension[mm]				Net weight [kg]
	P_2	DIN flange		D1	D2	
	[kW]	H1	H2			DIN flange
HCR 3-2	0.37	279	474	141	115	23.4
HCR 3-3	0.37	279	474	141	115	23.4
HCR 3-4	0.37	297	492	141	115	23.8
HCR 3-5	0.37	315	510	141	115	24.2
HCR 3-6	0.55	333	528	141	115	25.0
HCR 3-7	0.55	351	546	141	115	25.4
HCR 3-8	0.75	375	610	141	115	27.9
HCR 3-9	0.75	393	628	141	115	28.3
HCR 3-10	0.75	411	646	141	115	28.7
HCR 3-11	1.1	429	664	141	115	30.2
HCR 3-12	1.1	447	682	141	115	30.5
HCR 3-13	1.1	465	700	141	115	30.9
HCR 3-15	1.1	501	736	141	141	31.6
HCR 3-17	1.5	553	844	177	141	41.0
HCR 3-19	1.5	589	880	177	141	41.8
HCR 3-21	2.2	625	916	177	141	45.3
HCR 3-23	2.2	661	952	177	141	46.1
HCR 3-25	2.2	697	988	177	141	46.8
HCR 3-27	2.2	733	1024	177	141	47.6
HCR 3-29	2.2	769	1060	177	141	48.3
HCR 3-31	3	809	1125	197	147	56.6
HCR 3-33	3	845	1161	197	147	57.4
HCR 3-36	3	899	1215	197	147	58.5



MCKARLEN

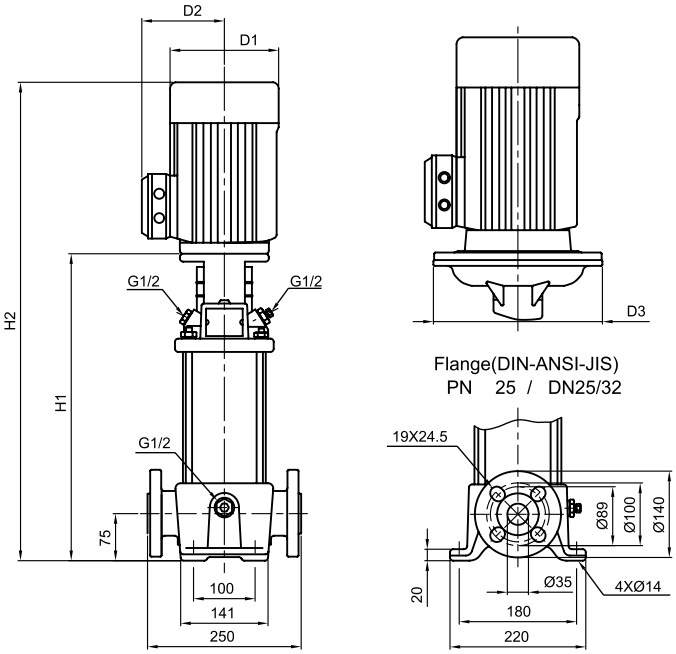
Performance Curve
HCR 5



MCKARLEN

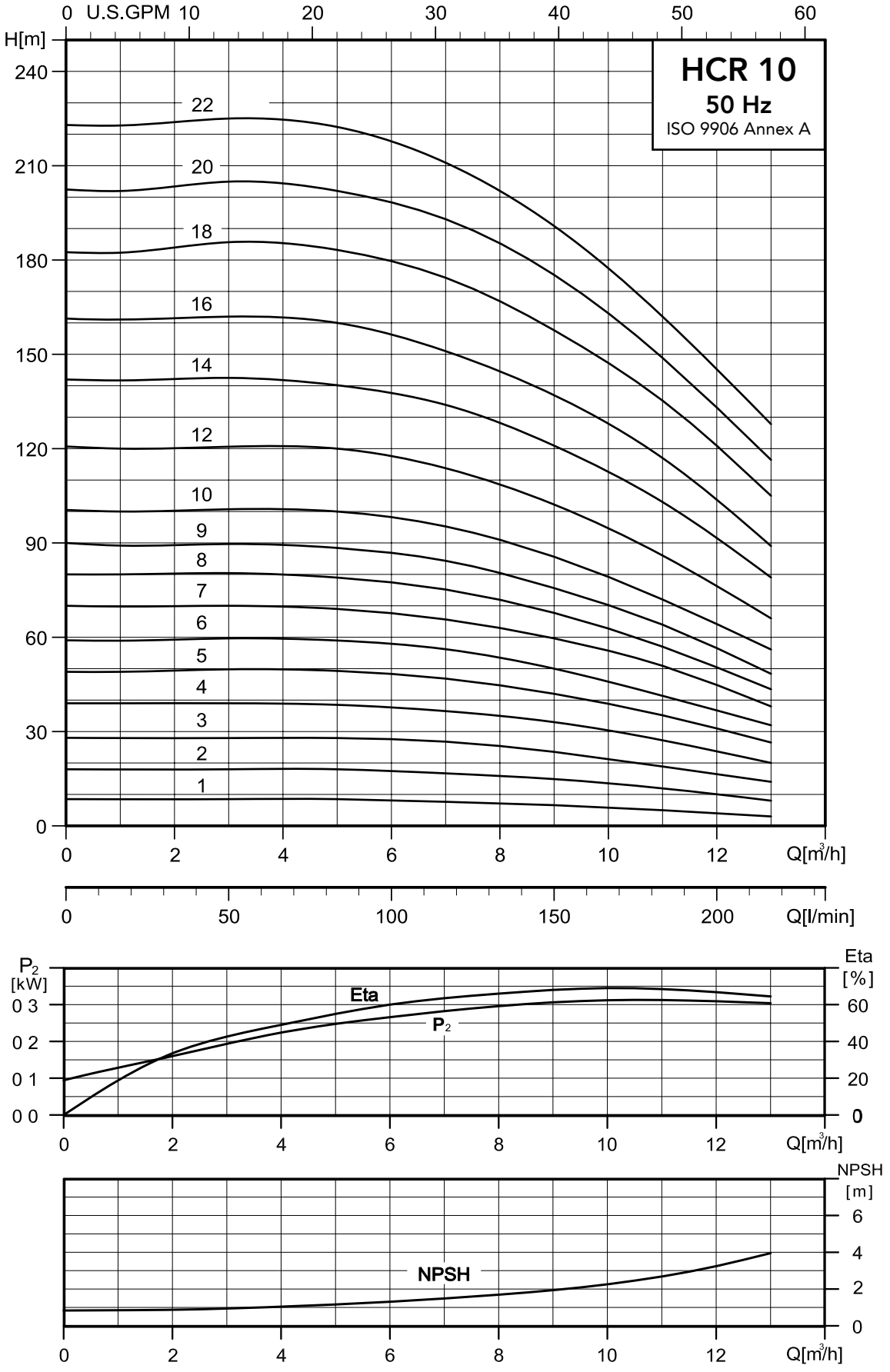
Dimensions and Weights
HCR 5

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 5-2	0.37	279	474	141	115	—	23.3
HCR 5-3	0.55	306	501	141	115	—	24.2
HCR 5-4	0.55	333	528	141	115	—	24.8
HCR 5-5	0.75	366	601	141	115	—	27.4
HCR 5-6	1.1	393	628	141	115	—	29.1
HCR 5-7	1.1	420	655	141	115	—	29.6
HCR 5-8	1.1	447	682	141	115	—	30.1
HCR 5-9	1.5	490	781	177	141	—	39.3
HCR 5-10	1.5	517	808	177	141	—	39.9
HCR 5-11	2.2	544	835	177	141	—	43.2
HCR 5-12	2.2	571	862	177	141	—	43.7
HCR 5-13	2.2	598	889	177	141	—	44.2
HCR 5-14	2.2	625	916	177	141	—	44.8
HCR 5-15	2.2	652	943	177	141	—	45.2
HCR 5-16	2.2	679	970	177	141	—	45.8
HCR 5-18	3	737	1053	197	147	—	54.3
HCR 5-20	3	791	1107	197	147	—	55.5
HCR 5-22	4	845	1171	220	161	—	59.8
HCR 5-24	4	899	1225	220	161	—	60.8
HCR 5-26	4	953	1279	220	161	—	62.7
HCR 5-29	4	1034	1360	220	161	—	64.6
HCR 5-32	5.5	1145	1507	235	197	300	90.1
HCR 5-36	5.5	1253	1615	235	197	300	92.6



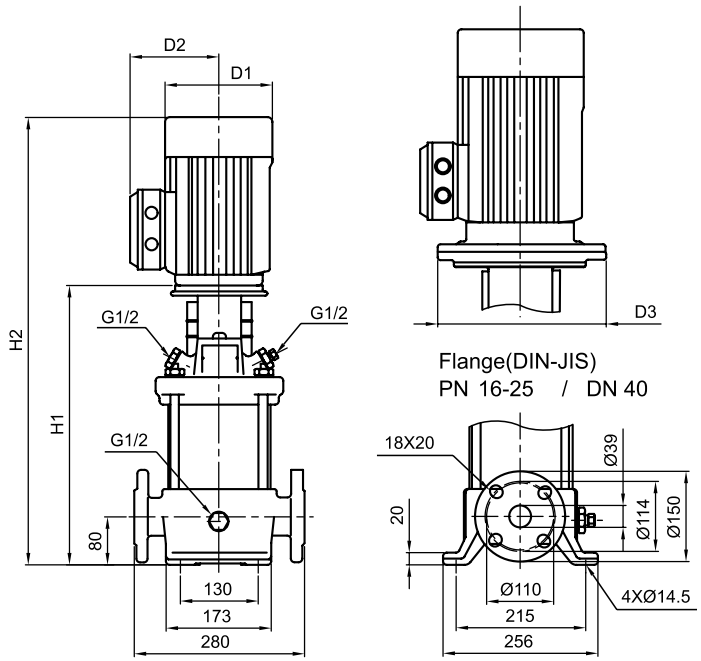
MCKARLEN

Performance Curve
HCR 10

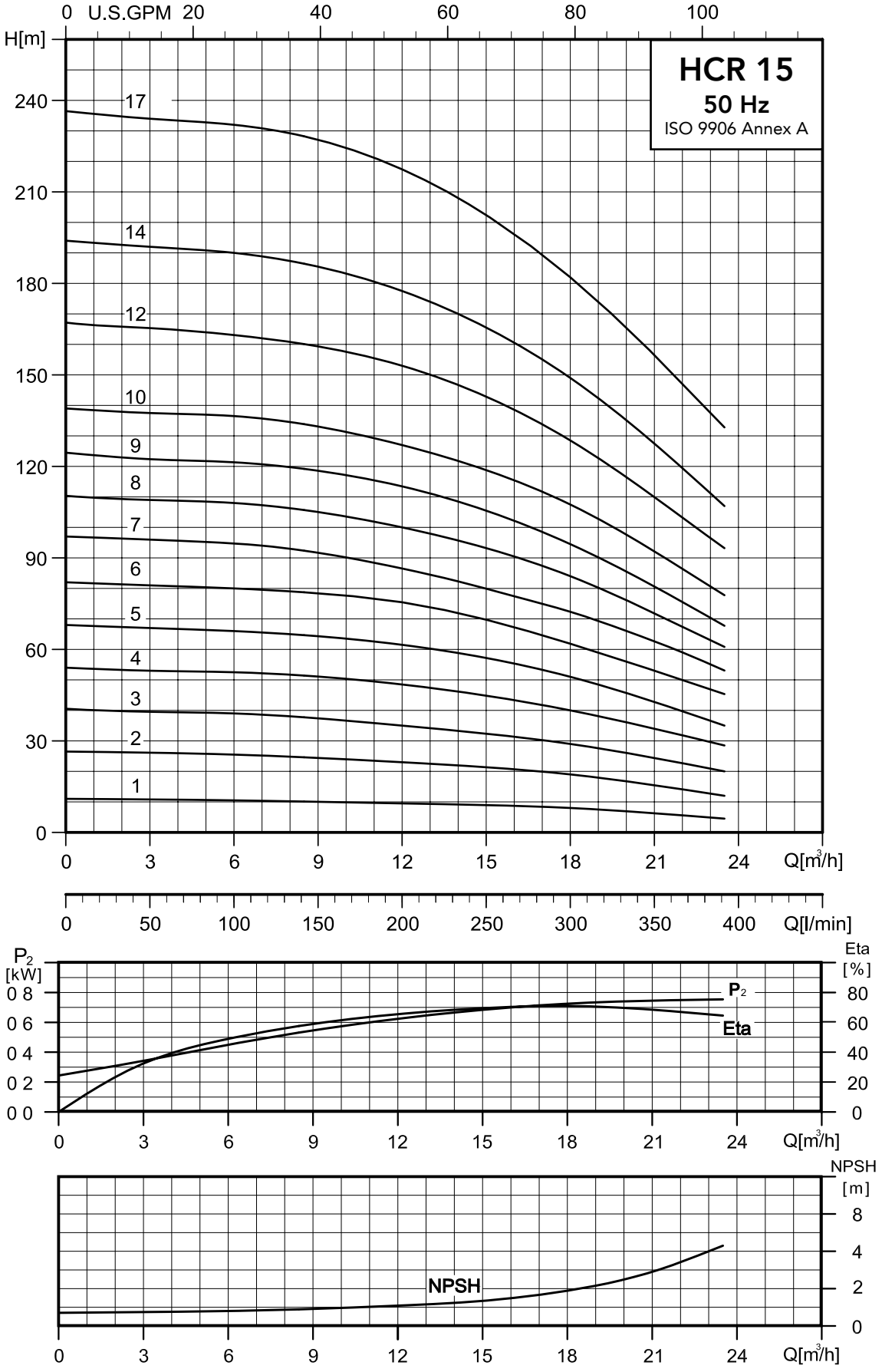


Dimensions and Weights
HCR 10

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 10-1	0.37	343	538	141	115	—	35.9
HCR 10-2	0.75	347	582	141	115	—	38.2
HCR 10-3	1.1	377	612	141	115	—	40.3
HCR 10-4	1.5	423	714	177	141	—	50.1
HCR 10-5	2.2	453	744	177	141	—	53.9
HCR 10-6	2.2	483	774	177	141	—	55.0
HCR 10-7	3	518	834	197	147	—	63.8
HCR 10-8	3	548	864	197	147	—	64.9
HCR 10-9	3	578	894	197	147	—	65.9
HCR 10-10	4	608	934	220	161	—	70.3
HCR 10-12	4	668	994	220	161	—	72.4
HCR 10-14	5.5	760	1122	235	197	300	104.1
HCR 10-16	5.5	820	1182	235	197	300	106.2
HCR 10-18	7.5	880	1278	235	197	300	113.6
HCR 10-20	7.5	940	1338	235	197	300	116.7
HCR 10-22	7.5	1000	1398	235	197	300	118.8



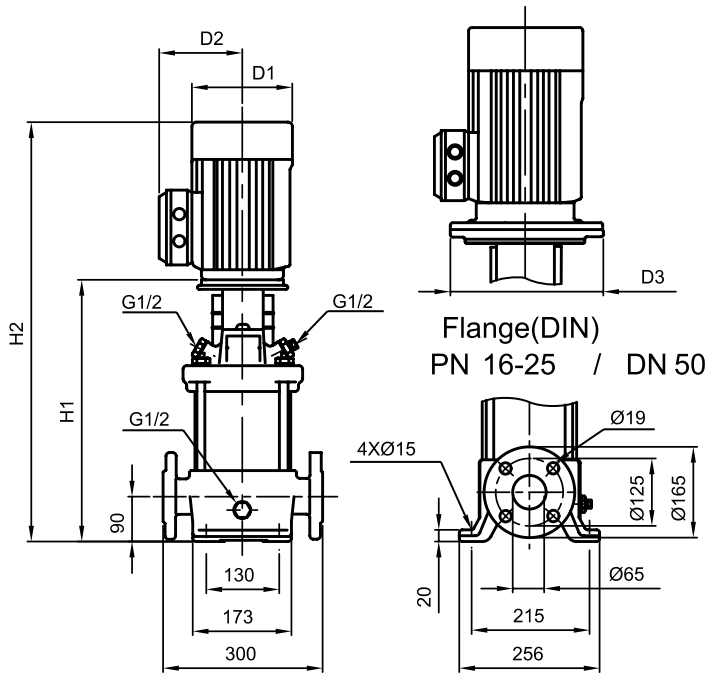
Performance Curve
HCR 15



MCKARLEN

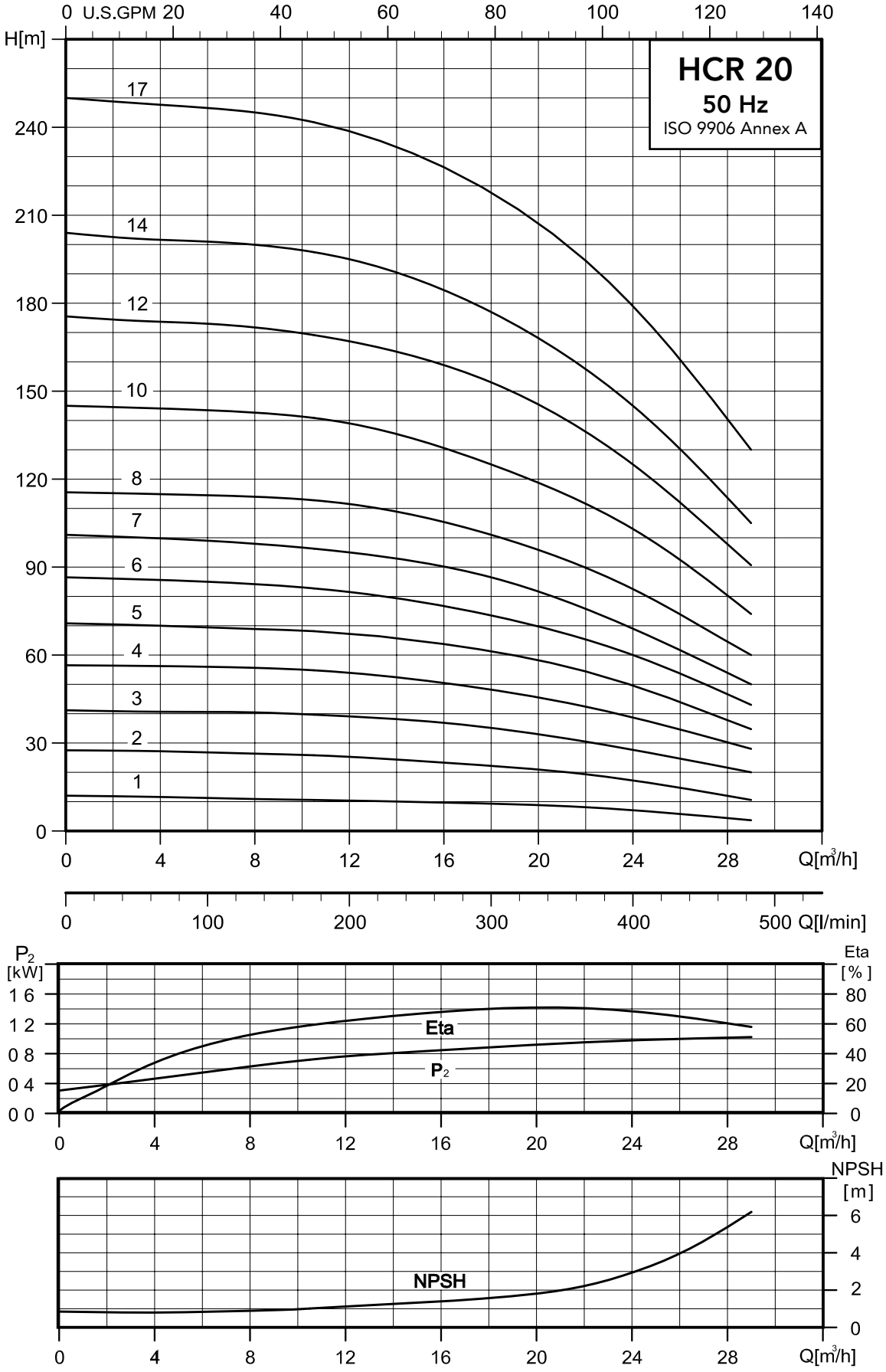
Dimensions and Weights
HCR 15

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 15-1	1.1	400	635	141	115	—	43.8
HCR 15-2	2.2	415	706	177	141	—	55.7
HCR 15-3	3	465	781	197	147	—	64.9
HCR 15-4	4	510	836	220	161	—	69.7
HCR 15-5	4	555	881	220	161	—	71.2
HCR 15-6	5.5	632	994	235	197	300	102.3
HCR 15-7	5.5	677	1039	235	197	300	103.8
HCR 15-8	7.5	722	1120	235	197	300	111.8
HCR 15-9	7.5	767	1165	235	197	300	113.3
HCR 15-10	11	889	1394	318	245	350	151.0
HCR 15-12	11	979	1484	318	245	350	154.0
HCR 15-14	11	1069	1574	318	245	350	157.3
HCR 15-17	15	1204	1714	318	245	350	172.4



MCKARLEN

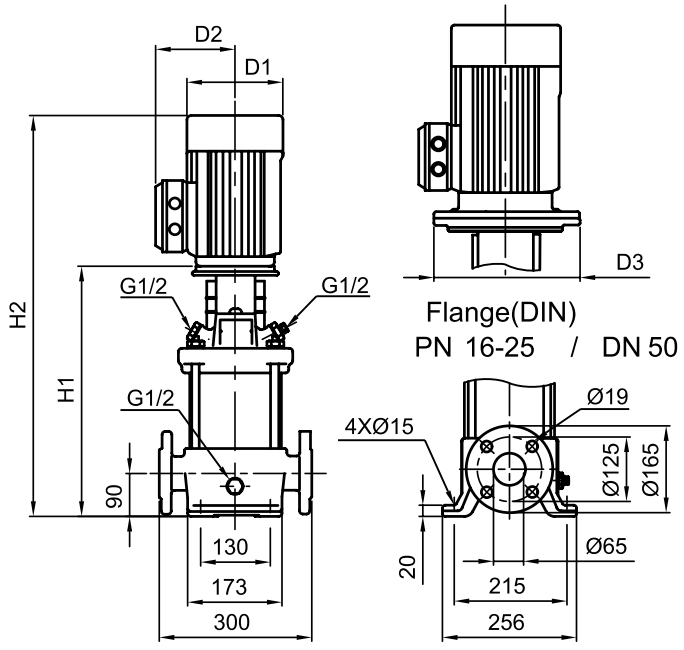
Performance Curve
HCR 20



MCKARLEN

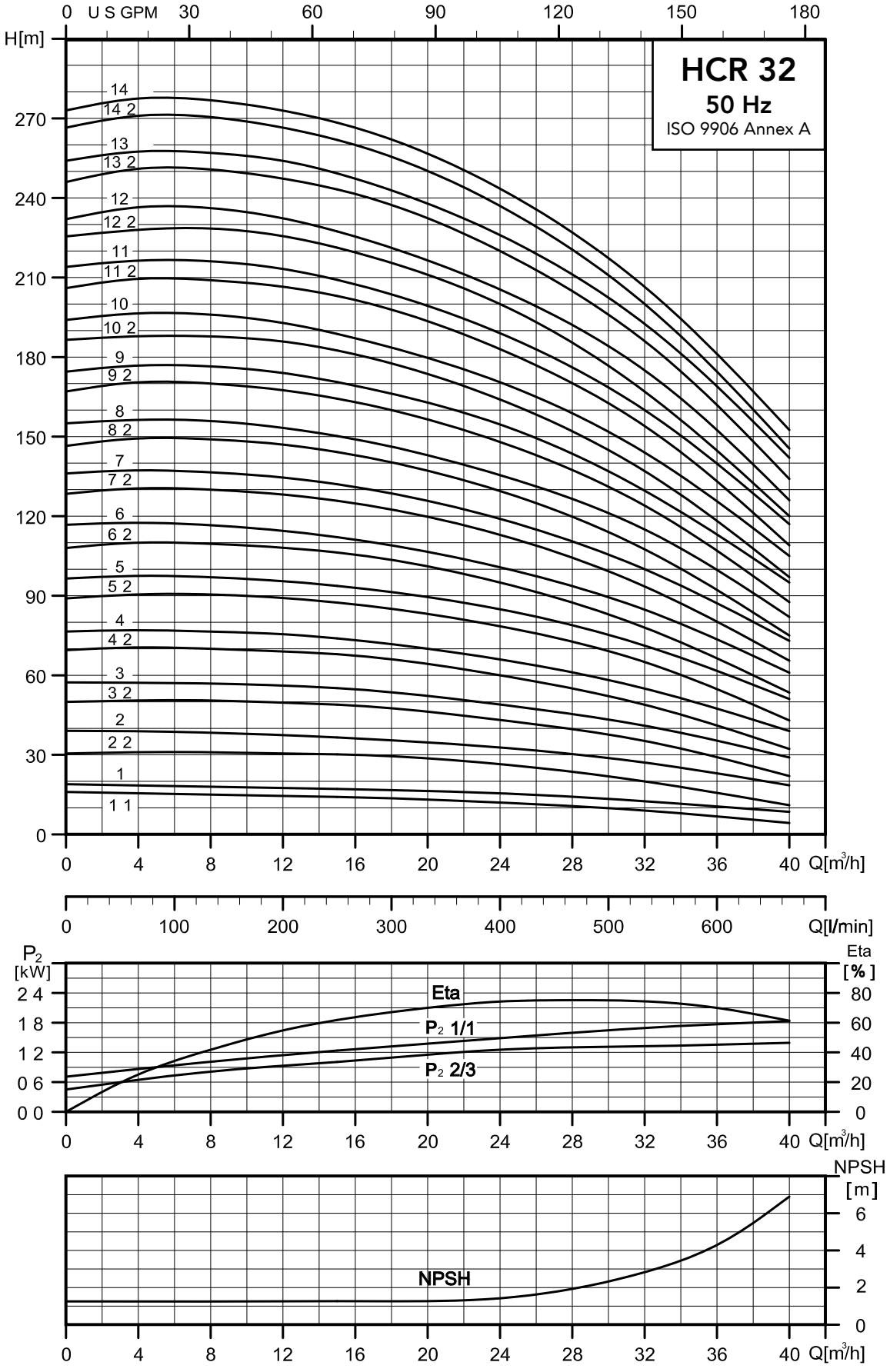
Dimensions and Weights
HCR 20

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 20-1	1.1	400	636	141	115	—	43.9
HCR 20-2	2.2	415	708	177	141	—	55.7
HCR 20-3	4	465	795	220	161	—	68.3
HCR 20-4	5.5	542	910	235	197	300	99.4
HCR 20-5	5.5	587	955	235	197	300	100.8
HCR 20-6	7.5	632	1038	235	197	300	108.6
HCR 20-7	7.5	677	1083	235	197	300	110.1
HCR 20-8	11	799	1315	318	245	350	148.1
HCR 20-10	11	889	1405	318	245	350	151.0
HCR 20-12	15	979	1504	318	245	350	164.0
HCR 20-14	15	1069	1594	318	245	350	166.9
HCR 20-17	18.5	1204	1773	318	245	350	195.4



MCKARLEN

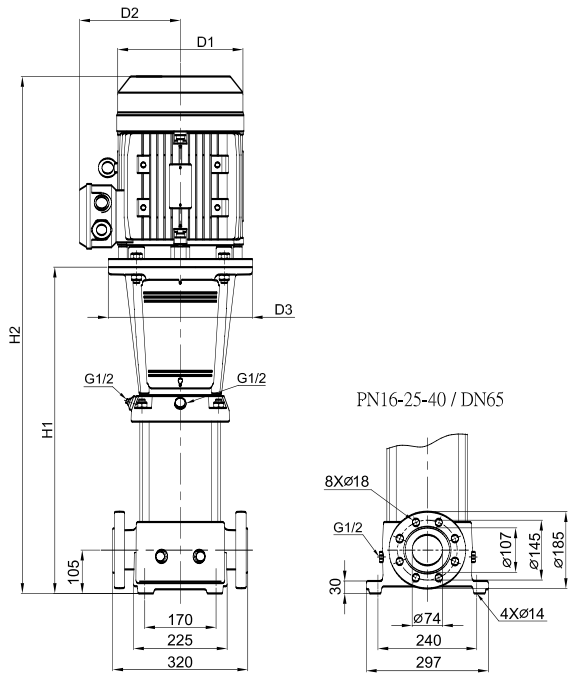
Performance Curve
HCR 32



MCKARLEN

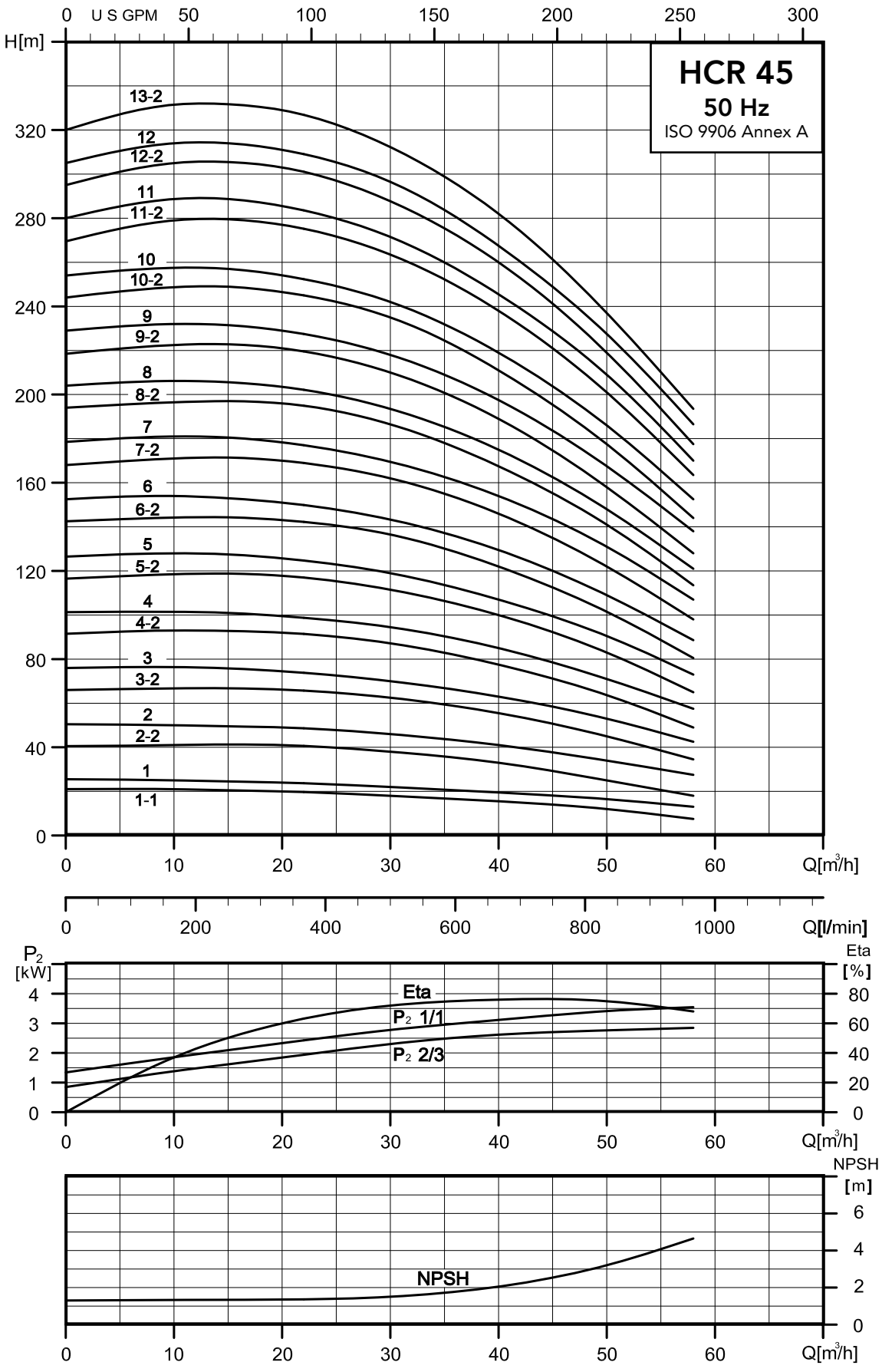
Dimensions and Weights
HCR 32

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 32-1-1	1.5	504	795	177	141	280	71.5
HCR 32-1	2.2	504	795	177	141	280	74.3
HCR 32-2-2	3	574	935	197	147	280	84.2
HCR 32-2	4	574	900	220	161	280	87.6
HCR 32-3-2	5.5	644	1006	235	197	300	110.2
HCR 32-3	5.5	644	1006	235	197	300	110.2
HCR 32-4-2	7.5	714	1112	235	197	300	119.5
HCR 32-4	7.5	714	1112	235	197	300	119.5
HCR 32-5-2	11	894	1399	318	245	350	164.3
HCR 32-5	11	894	1399	318	245	350	164.3
HCR 32-6-2	11	964	1469	318	245	350	167.3
HCR 32-6	11	964	1469	318	245	350	167.3
HCR 32-7-2	15	1034	1544	318	245	350	180.4
HCR 32-7	15	1034	1544	318	245	350	180.4
HCR 32-8-2	15	1104	1614	318	245	350	183.5
HCR 32-8	15	1104	1614	318	245	350	183.5
HCR 32-9-2	18.5	1174	1724	318	245	350	210.6
HCR 32-9	18.5	1174	1724	318	245	350	210.6
HCR 32-10-2	18.5	1244	1794	318	245	350	212.7
HCR 32-10	18.5	1244	1794	318	245	350	213.7
HCR 32-11-2	22	1314	1894	358	265	350	258.8
HCR 32-11	22	1314	1894	358	265	350	258.8
HCR 32-12-2	22	1384	1964	358	265	350	260.8
HCR 32-12	22	1384	1964	358	265	350	260.8
HCR 32-13-2	30	1454	2114	420	295	400	348.2
HCR 32-13	30	1454	2114	420	295	400	348.2
HCR 32-14-2	30	1524	2184	420	295	400	351.3
HCR 32-14	30	1524	2184	420	295	400	351.3



MCKARLEN

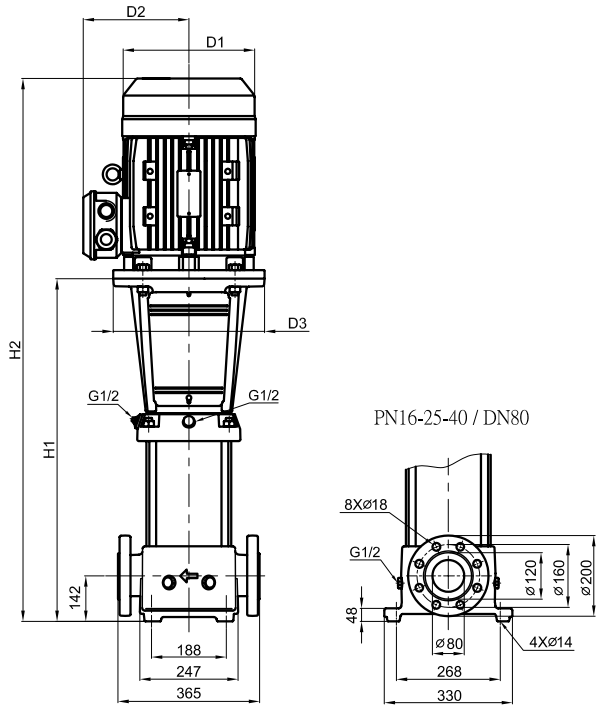
Performance Curve
HCR 45



MCKARLEN

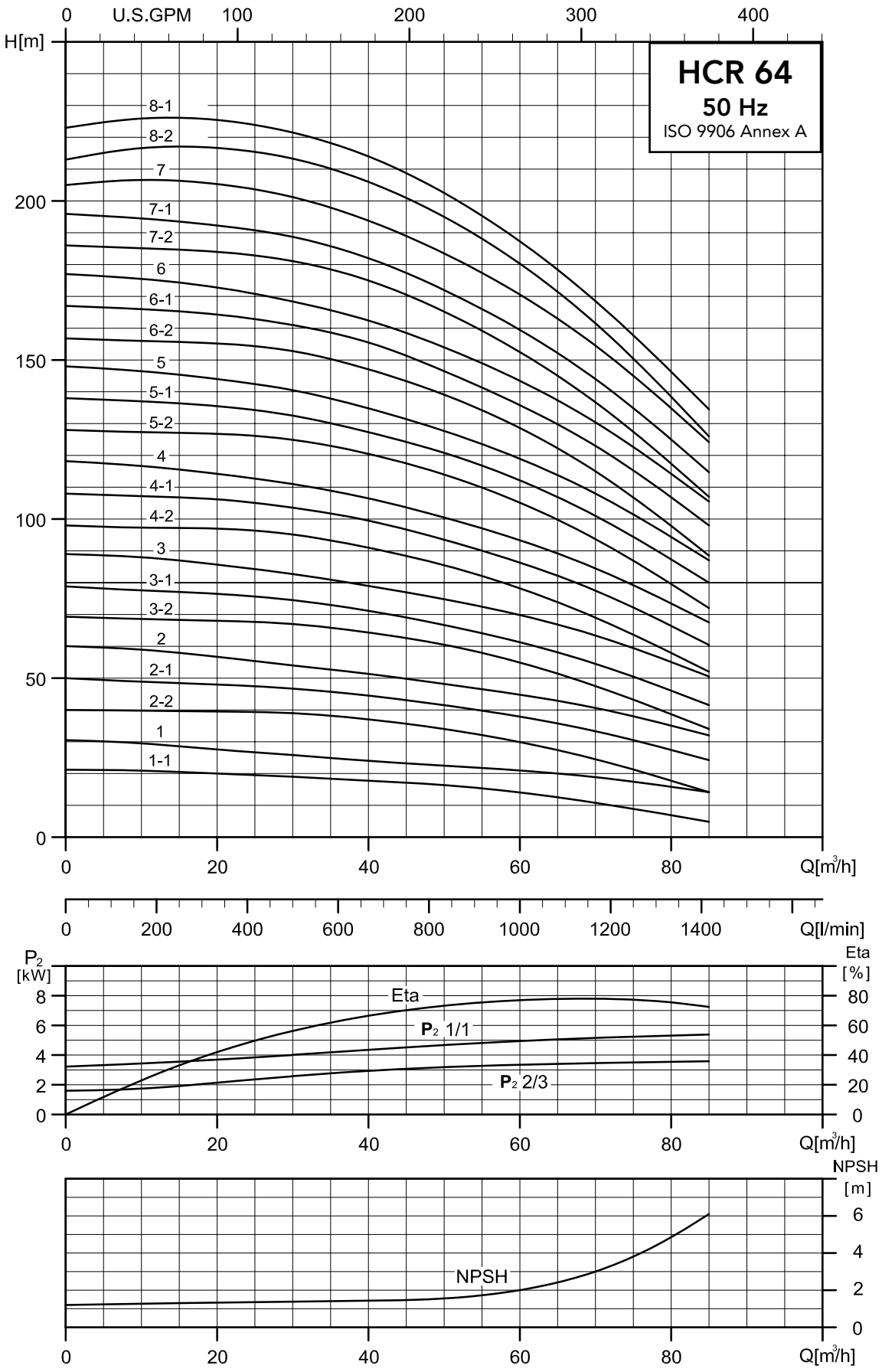
Dimensions and Weights
HCR 45

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 45-1-1	3	561	877	197	147	280	91.7
HCR 45-1	4	561	887	220	161	280	95.1
HCR 45-2-2	5.5	641	1003	235	197	300	118.3
HCR 45-2	7.5	641	1039	235	197	300	124.6
HCR 45-3-2	11	831	1336	318	245	350	170.0
HCR 45-3	11	831	1336	318	245	350	170.0
HCR 45-4-2	15	911	1421	318	245	350	183.8
HCR 45-4	15	911	1421	318	245	350	183.8
HCR 45-5-2	18.5	991	1541	318	245	350	211.6
HCR 45-5	18.5	991	1541	318	245	350	211.6
HCR 45-6-2	22	1071	1651	358	265	350	258.1
HCR 45-6	22	1071	1651	358	265	350	258.1
HCR 45-7-2	30	1151	1811	420	295	400	346.4
HCR 45-7	30	1151	1811	420	295	400	346.5
HCR 45-8-2	30	1231	1891	420	295	400	350.2
HCR 45-8	30	1231	1891	420	295	400	351.3
HCR 45-9-2	30	1311	1971	420	295	400	354.0
HCR 45-9	37	1311	1971	420	295	400	375.0
HCR 45-10-2	37	1391	2051	420	295	400	378.7
HCR 45-10	37	1391	2051	420	295	400	378.7
HCR 45-11-2	45	1471	2161	470	325	450	430.5
HCR 45-11	45	1471	2161	470	325	450	430.5
HCR 45-12-2	45	1551	2241	470	325	450	434.2
HCR 45-12	45	1551	2241	470	325	450	434.2
HCR 45-13-2	45	1631	2321	470	325	450	437.9



MCKARLEN

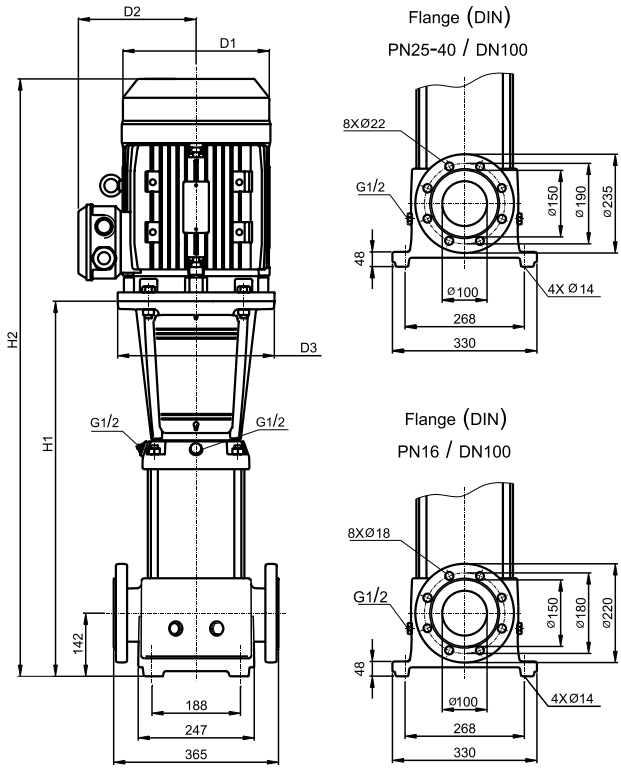
Performance Curve
HCR 64



MCKARLEN

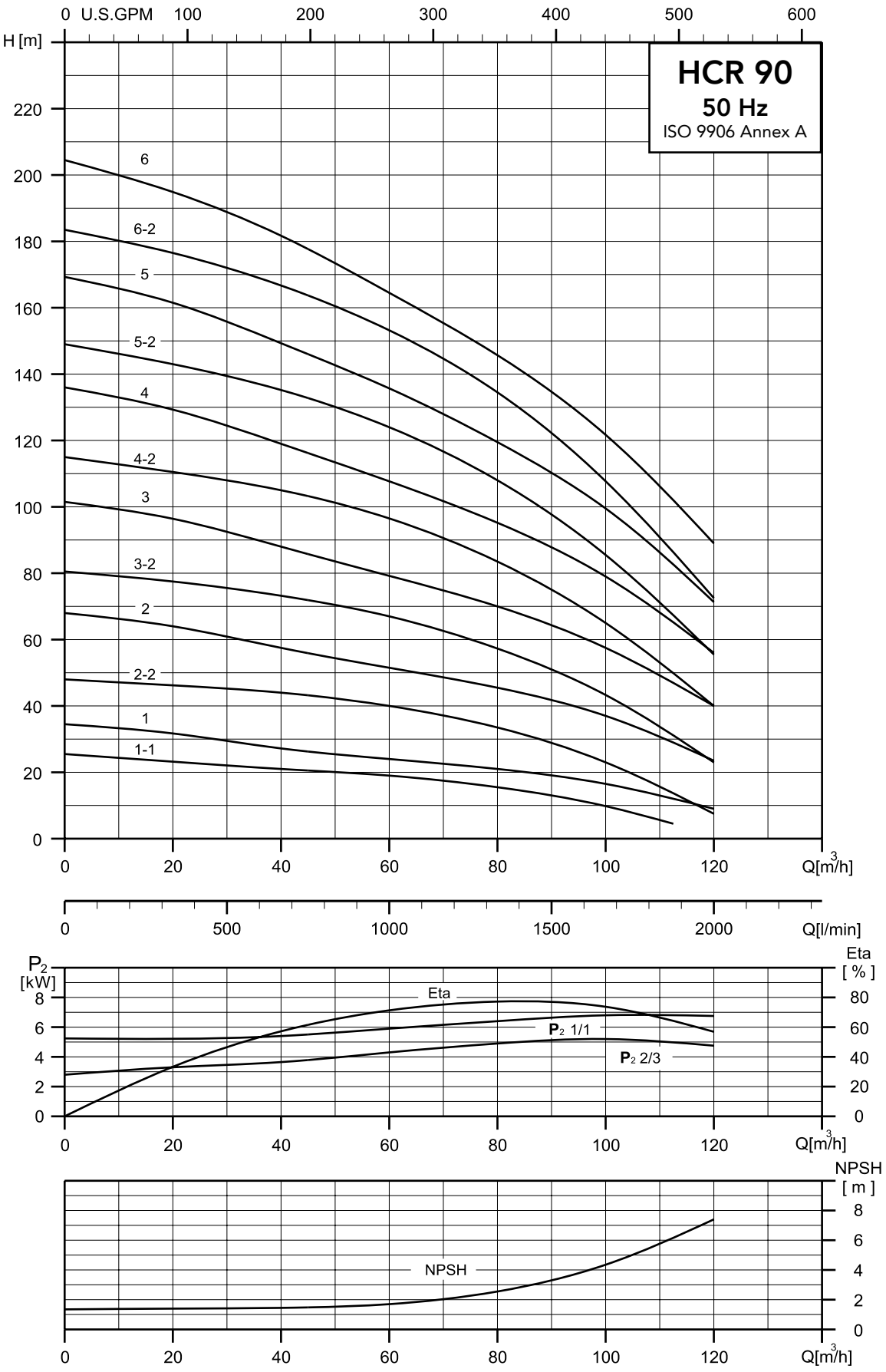
Dimensions and Weights
HCR 64

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 64-1-1	4	563	889	220	161	280	88.9
HCR 64-1	5.5	563	925	235	197	300	108.3
HCR 64-2-2	7.5	646	1044	235	197	300	118.7
HCR 64-2-1	11	756	1261	318	245	350	160.3
HCR 64-2	11	756	1261	318	245	350	160.3
HCR 64-3-2	15	838	1348	318	245	350	174.9
HCR 64-3-1	15	838	1348	318	245	350	174.9
HCR 64-3	18.5	838	1388	318	245	350	198.9
HCR 64-4-2	18.5	921	1471	318	245	350	202.9
HCR 64-4-1	22	921	1501	358	265	350	245.7
HCR 64-4	22	921	1501	358	265	350	245.7
HCR 64-5-2	30	1003	1663	420	295	400	334.3
HCR 64-5-1	30	1003	1663	420	295	400	334.3
HCR 64-5	30	1003	1663	420	295	400	334.3
HCR 64-6-2	30	1086	1746	420	295	400	338.2
HCR 64-6-1	37	1086	1746	420	295	400	359.2
HCR 64-6	37	1086	1746	420	295	400	359.2
HCR 64-7-2	37	1168	1828	420	295	400	363.3
HCR 64-7-1	37	1168	1828	420	295	400	363.3
HCR 64-7	45	1172	1862	470	325	450	411.4
HCR 64-8-2	45	1255	1945	470	325	450	415.5
HCR 64-8-1	45	1255	1945	470	325	450	415.5



MCKARLEN

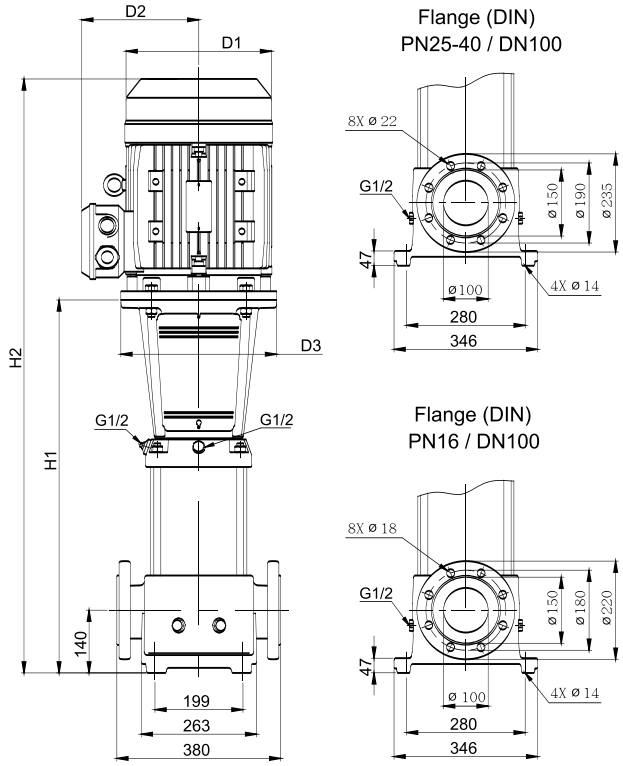
Performance Curve
HCR 90



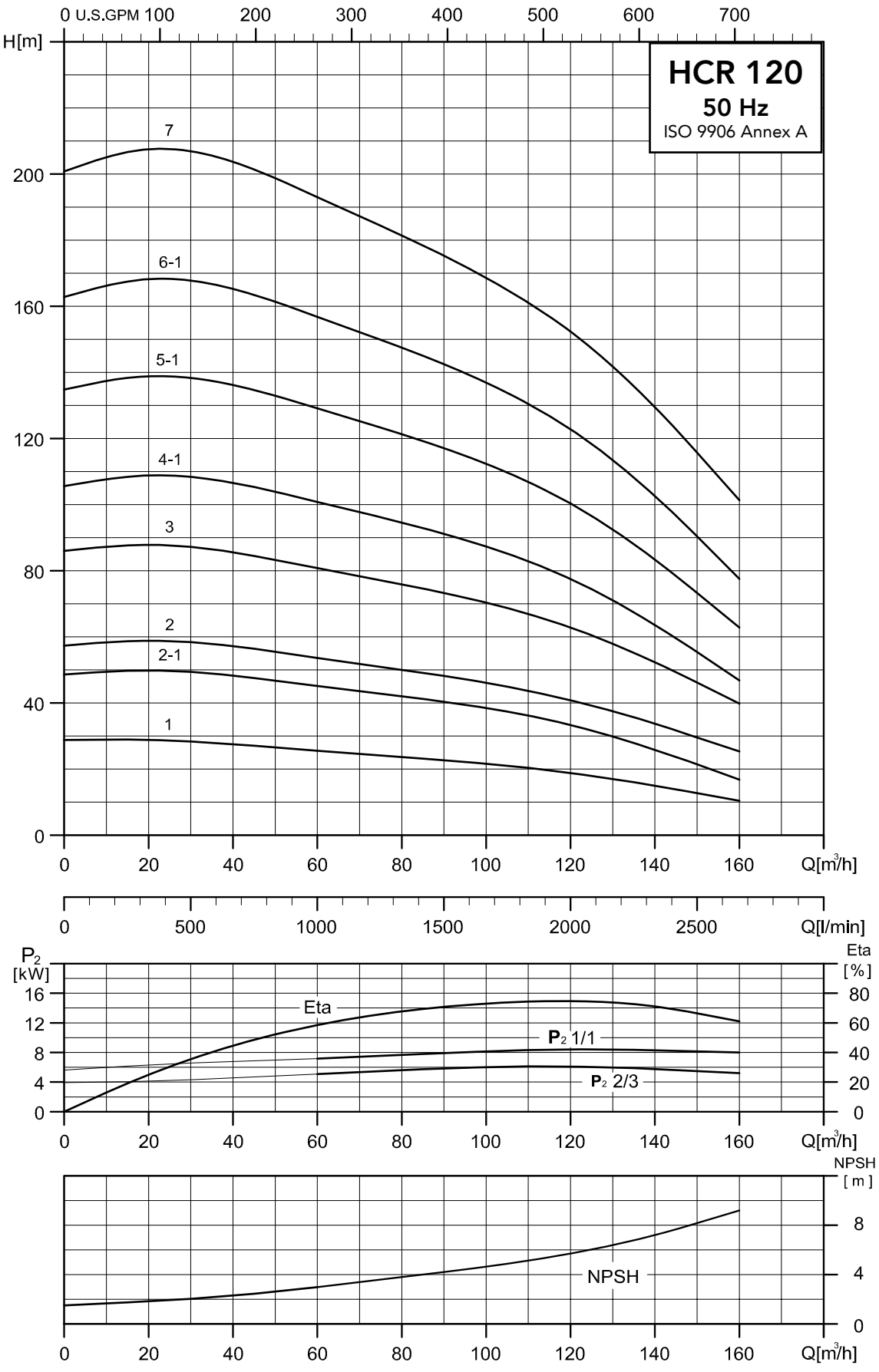
MCKARLEN

Dimensions and Weights
HCR 90

Pump type	Motor	Dimension[mm]					Net weight [kg]
	P_2	DIN flange		D1	D2	D3	
	[kW]	H1	H2				DIN flange
HCR 90-1-1	5.5	572	934	235	197	300	122.2
HCR 90-1	7.5	572	970	235	197	300	128.5
HCR 90-2-2	11	774	1279	318	245	350	175.4
HCR 90-2	15	774	1284	318	245	350	185.4
HCR 90-3-2	18.5	866	1416	318	245	350	214.7
HCR 90-3	22	866	1446	358	265	350	257.5
HCR 90-4-2	30	958	1618	420	295	400	347.3
HCR 90-4	30	958	1618	420	295	400	347.3
HCR 90-5-2	37	1050	1710	420	295	400	347.9
HCR 90-5	37	1050	1710	420	295	400	347.9
HCR 90-6-2	45	1142	1832	470	325	450	428.2
HCR 90-6	45	1142	1832	470	325	450	428.3



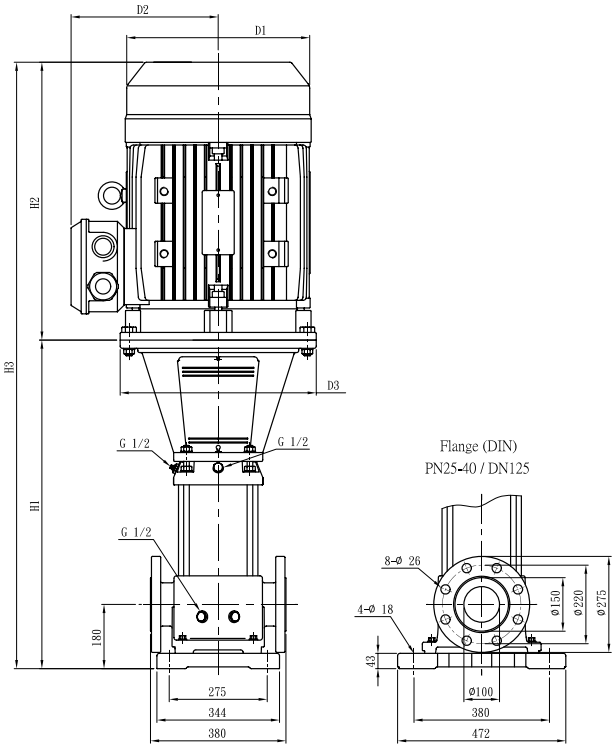
Performance Curve
HCR 120



MCKARLEN

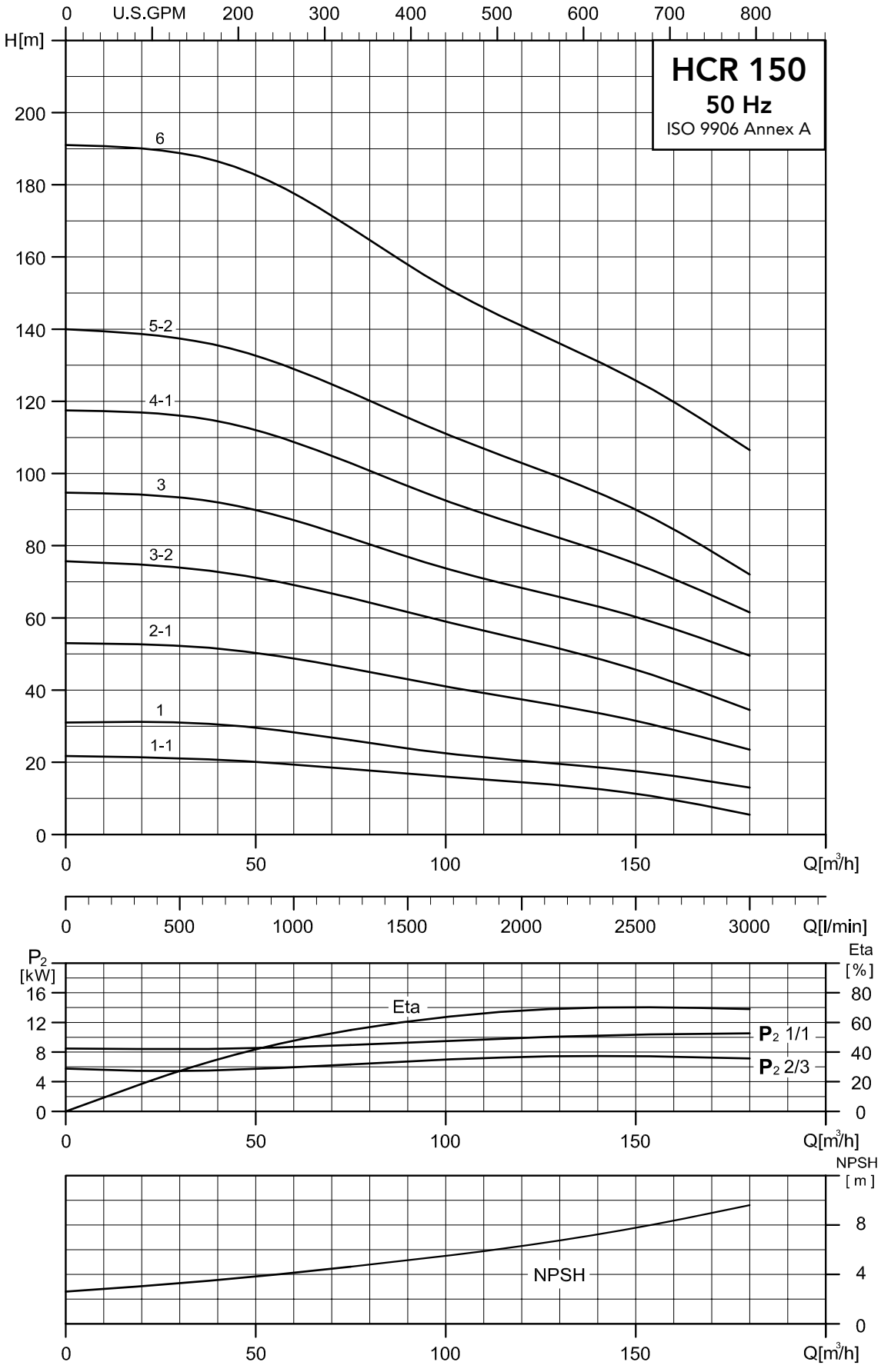
Dimensions and Weights
HCR 120

Pump type	Motor	Dimension[mm]						Net weight [kg]
	P_2	DIN flange			D1	D2	D3	
	[kW]	H1	H2	H3				DIN flange
HCR 120-1	11	834	505	1339	318	245	350	201.1
HCR 120-2-1	18.5	990	550	1540	318	245	350	245.1
HCR 120-2	22	990	580	1570	358	265	350	291.8
HCR 120-3	30	1145	660	1805	420	295	400	382.5
HCR 120-4-1	37	1301	660	1961	420	295	400	413.5
HCR 120-5-1	45	1460	690	2150	470	325	450	471.6
HCR 120-6-1	55	1642	770	2412	510	355	550	604.8
HCR 120-7	75	1797	845	2642	580	410	550	736.4



MCKARLEN

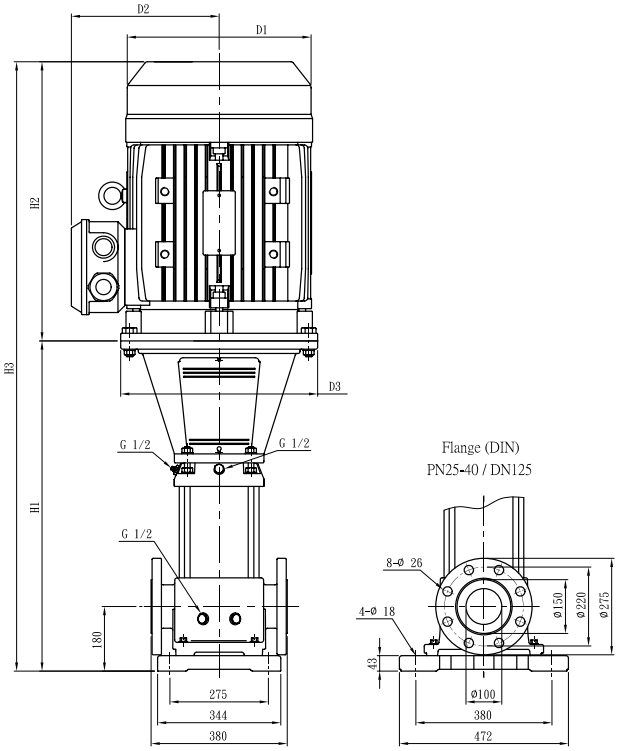
Performance Curve
HCR 150



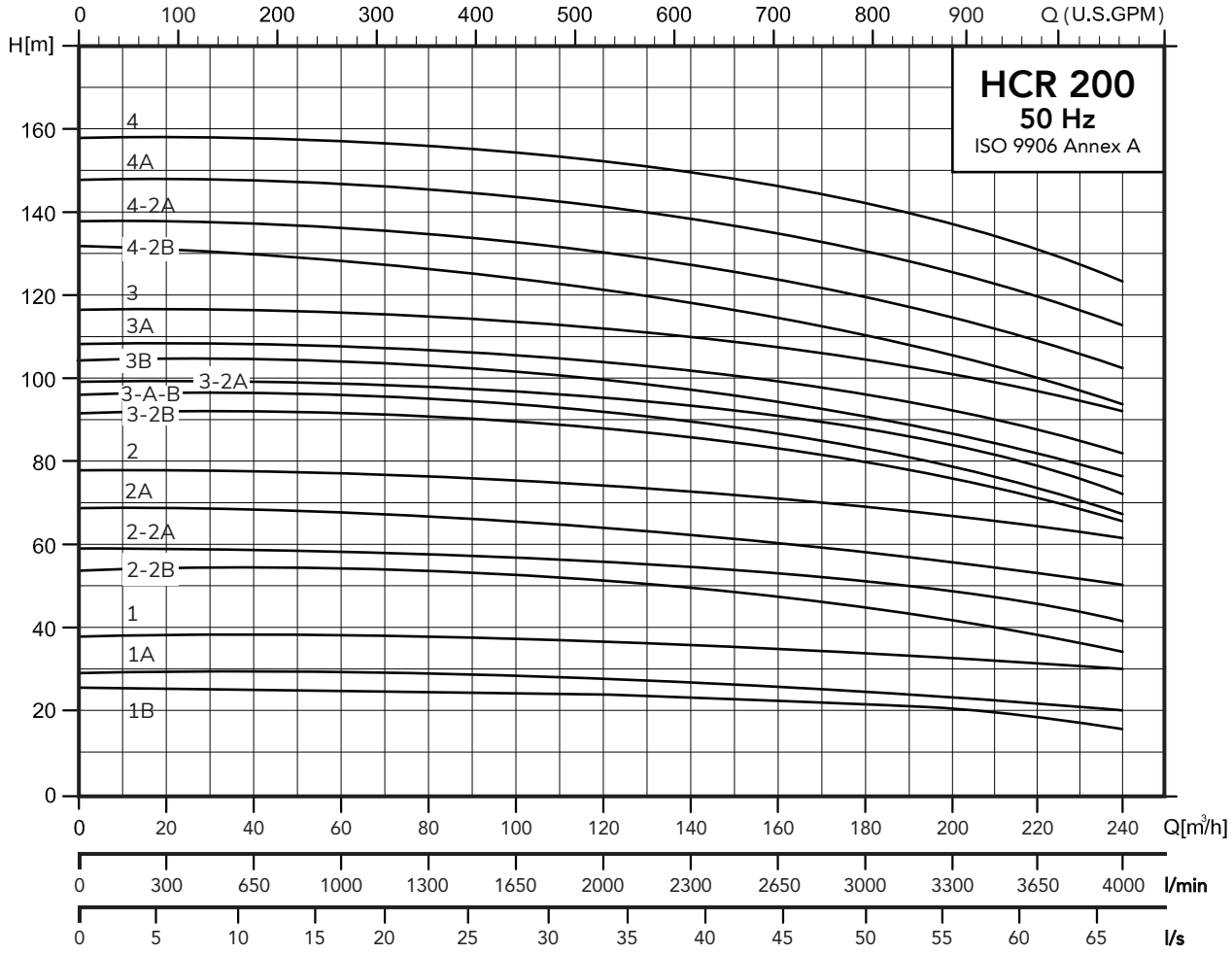
MCKARLEN

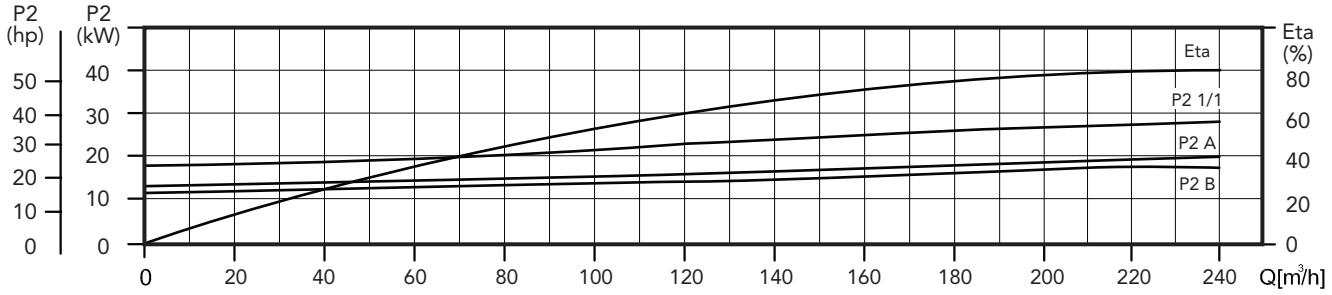
Dimensions and Weights
HCR 150

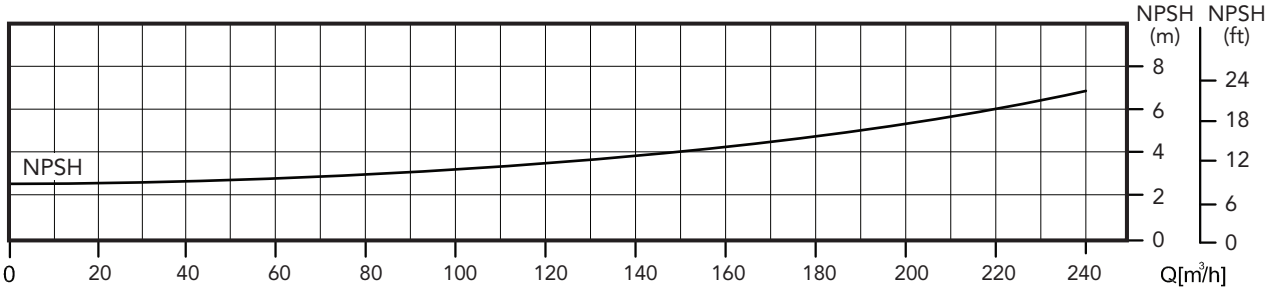
Pump type	Motor	Dimension[mm]						Net weight [kg]
	P_2	DIN flange			D1	D2	D3	
	[kW]	H1	H2	H3				DIN flange
HCR 150-1-1	11	834	505	1339	318	245	350	201.0
HCR 150-1	15	834	510	1344	318	245	350	211.0
HCR 150-2-1	22	990	580	1570	358	265	350	287.8
HCR 150-3-2	30	1145	660	1805	420	295	400	382.3
HCR 150-3	37	1145	660	1805	420	295	400	403.4
HCR 150-4-1	45	1305	690	1995	470	325	450	461.4
HCR 150-5-2	55	1486	770	2256	510	355	550	594.7
HCR 150-6	75	1642	845	2487	580	410	550	726.0



Performance Curve
HCR 200



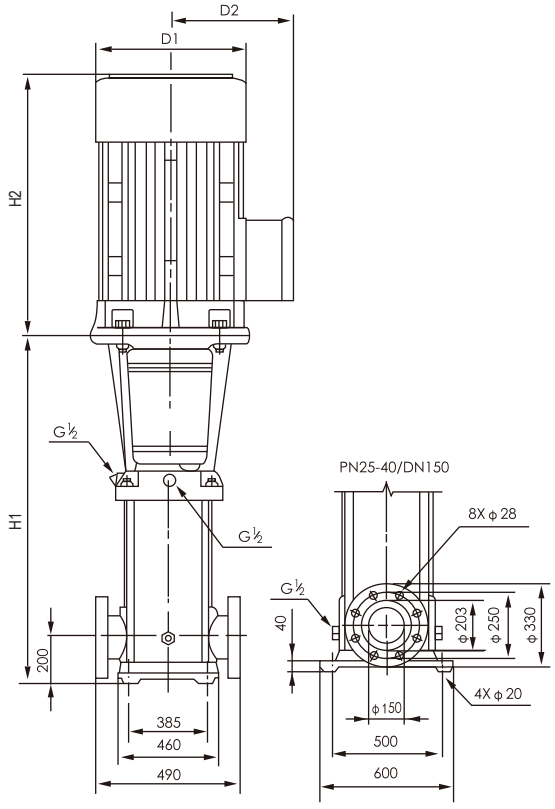




MCKARLEN

Dimensions and Weights
HCR 200

Pump type	Motor P_2	Dimension[mm]				Net weight [kg]
		DIN flange		D1	D2	
	[kW]	H1	H2			DIN flange
HCR 200-1-B	18.5	907	550	330	255	311
HCR 200-1-A	22	907	575	360	285	347
HCR 200-1	30	907	650	400	310	403
HCR 200-2-2B	37	1101	650	400	310	447
HCR 200-2-2A	45	1101	685	460	340	504
HCR 200-2A	55	1131	760	540	370	595
HCR 200-2	55	1131	760	540	370	595
HCR 200-3-2B	75	1325	845	580	410	748
HCR 200-3-A-B	75	1325	845	580	410	748
HCR 200-3-2A	75	1325	845	580	410	748
HCR 200-3B	75	1325	845	580	410	748
HCR 200-3A	75	1325	845	580	410	748
HCR 200-3	90	1325	895	580	410	817
HCR 200-4-2B	90	1519	895	580	410	830
HCR 200-4-2A	110	1519	1140	645	550	1180
HCR 200-4A	110	1519	1140	645	550	1180
HCR 200-4	110	1519	1140	645	550	1180



Head Losses on Iron Pipe (galvanized)
Pressure Loss in meters for every 100 meters of horiontal pipe.

Water Volume			Lost pressure for every 100 meters											
			Pipe Diameter size (Inch)											
m³/hr	L/Min	L/S	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"
0.6	10	0.17	9.91	2.41	0.78									
0.9	15	0.25	20.11	4.86	1.57	0.42								
1.2	20	0.33	33.53	8.04	2.59	0.68	0.35							
1.5	25	0.42	49.93	11.91	3.83	1.00	0.51							
1.8	30	0.50	69.34	16.50	5.28	1.38	0.70	0.22						
2.1	35	0.58	91.54	21.75	6.95	1.81	0.91	0.29						
2.4	40	0.67		27.66	8.82	2.29	1.16	0.37						
3	50	0.83		41.40	13.14	3.40	1.72	0.54	0.16					
3.6	60	1.00		57.74	18.28	4.72	2.38	0.75	0.22					
4.2	70	1.17		76.49	24.18	6.23	3.13	0.99	0.29	0.13				
4.8	80	1.33			30.87	7.94	3.99	1.25	0.36	0.16				
5.4	90	1.50			38.30	9.83	4.93	1.55	0.45	0.20				
6	100	1.67			46.49	11.90	5.97	1.88	0.54	0.24	0.12			
7.5	125	2.08			70.41	17.93	8.97	2.80	0.81	0.37	0.19	0.10		
9	150	2.50				25.11	12.53	3.90	1.12	0.51	0.26	0.14		
10.5	175	2.92				33.32	16.66	5.18	1.49	0.67	0.34	0.18		
12	200	3.33				42.75	21.36	6.62	1.90	0.86	0.43	0.23	0.08	
15	250	4.17				64.86	32.32	10.03	2.86	1.28	0.65	0.35	0.13	
18	300	5.00					45.52	14.04	4.01	1.79	0.90	0.49	0.18	0.07
24	400	6.67					78.17	24.04	6.83	3.05	1.53	0.83	0.29	0.12
30	500	8.33						36.71	10.40	4.62	2.32	1.25	0.45	0.19
36	600	10.00						51.84	14.62	6.51	3.26	1.76	0.62	0.26
42	700	11.67							19.52	8.69	4.36	2.35	0.83	0.35
48	800	13.33							25.20	11.18	5.58	3.01	1.07	0.45
54	900	15.00							31.51	13.97	6.98	3.76	1.33	0.56
60	1000	16.67							38.43	17.06	8.52	4.60	1.62	0.67
75	1250	20.83								26.10	13.00	7.01	2.46	1.03
90	1500	25.00								36.97	18.42	9.89	3.47	1.44
105	1750	29.17									24.76	13.30	4.67	1.93
120	2000	33.33									31.94	17.16	6.00	2.50
150	2500	41.67										26.26	9.22	3.81
180	3000	50.00											13.05	5.42
240	4000	66.67											22.72	8.93
300	5000	83.33												14.42
90° Elbow & Slide Valve			1.00	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.60	1.70	2.00	2.50
T, Non Return Valve			4.00	4.00	4.00	5.00	5.00	5.00	6.00	6.00	6.00	7.00	8.00	9.00

Head Losses on PVC pipe
Pressure Loss in meters for every 100 meters of horizontal pipe.

Water Volume			Lost pressure for every 100 meters											
			Pipe Diameter size (Inch)											
m³/hr	L/Min	L/S	1”	1¼”	1½”	2”	2½”	3”	3½”	4”	5”	5½”	6”	7”
0.6	10	0.17	1.80	0.66	0.77	0.09								
0.9	15	0.25	4.00	1.14	0.60	0.18	0.03							
1.2	20	0.33	6.40	2.20	0.90	0.28	0.11							
1.5	25	0.42	10.00	3.50	1.40	0.43	0.17	0.07						
1.8	30	0.50	13.00	4.60	1.90	0.57	0.22	0.09						
2.1	35	0.58	16.00	6.00	2.00	0.70	0.27	0.12						
2.4	40	0.67	22.00	7.50	3.20	0.93	0.35	0.16	0.06					
3	50	0.83	37.00	11.00	4.80	1.40	0.50	0.22	0.09					
3.6	60	1.00	43.00	15.00	6.50	1.90	0.70	0.32	0.13	0.05				
4.2	70	1.17	50.00	18.00	8.00	2.50	0.83	0.38	0.17	0.07				
4.8	80	1.33		25.00	10.50	3.00	1.20	0.50	0.22	0.08				
5.4	90	1.50		30.00	12.00	3.50	1.30	0.57	0.26	0.09	0.05			
6	100	1.67		39.00	16.00	4.60	1.80	0.73	0.30	0.12	0.07			
7.5	125	2.08		50.00	24.00	6.60	2.50	1.10	0.50	0.18	0.10	0.06		
9	150	2.50			33.00	8.60	3.50	1.40	0.63	0.24	0.13	0.08		
10.5	175	2.92			38.00	11.00	4.30	1.80	0.78	0.30	0.18	0.09		
12	200	3.33			50.00	14.00	5.50	2.40	1.00	0.40	0.22	0.12	0.07	
15	250	4.17				21.00	8.00	3.70	1.50	0.57	0.34	0.18	0.11	0.06
18	300	5.00				28.00	10.50	4.60	1.95	0.77	0.45	0.25	0.13	0.09
24	400	6.67					19.00	8.00	3.60	1.40	0.78	0.44	0.23	0.15
30	500	8.33					28.00	11.50	5.00	2.00	1.20	0.63	0.33	0.21
36	600	10.00					37.00	15.00	6.60	2.60	1.50	0.82	0.45	0.28
42	700	11.67					47.00	24.00	8.00	3.50	1.90	1.10	0.60	0.40
48	800	13.33						26.00	11.00	4.50	2.60	1.40	0.81	0.48
54	900	15.00						33.00	13.50	5.50	3.20	1.70	0.95	0.58
60	1000	16.67						44.00	16.00	6.70	3.90	2.20	1.20	0.75
75	1250	20.83							25.00	9.00	5.00	3.00	1.60	0.95
90	1500	25.00							33.00	13.00	8.00	4.10	2.30	1.40
105	1750	29.17							44.00	17.50	9.70	5.70	3.20	1.90
120	2000	33.33								23.00	13.00	7.00	4.00	2.40
150	2500	41.67								34.00	18.00	10.50	6.00	3.50
180	3000	50.00								45.00	27.00	14.00	7.60	4.40
240	4000	66.67									43.00	24.00	13.00	7.50
300	5000	83.33										33.00	18.00	11.00

www.mckarlen.com

McKarlen Indonesia
DUTA INDAH ICONIC Blok B/3
Jl. MH Thamrin, Cikokol, Tangerang
Tel. +62 21-2986-6785
info@mckarlen.com

MCKARLEN