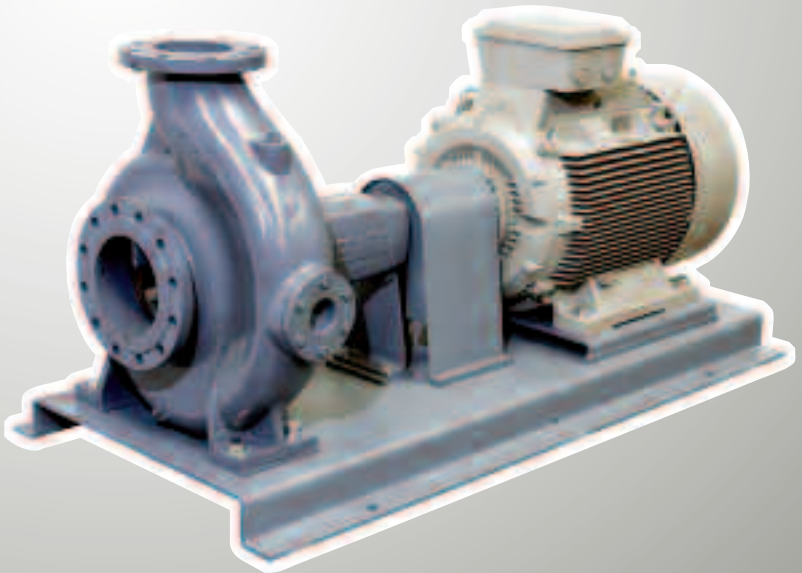
EBARA

FHA

END SUCTION VOLUTE ELECTRIC PUMPS
ISO 2858 (EX DIN 24256) PN 16

50 Hz



FHA

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

End suction volute pump in cast iron.

APPLICATIONS

- Water supply
- Fire-Fighting systems
- Hot and cold water supply
- Industrial use
- Swimming pool
- Sprinkling
- Air conditioning systems

TECHNICAL DETAILS

- Easy removal and maintenance, BPO (Back Pull Out) system allows all rotating elements to be removed without disconnecting suction and discharge pipework
- Top centerline discharge, foot support under casing for maximum resistance to misalignment and distorsion from pipe loads
- Non-overload design to ensure stable performance for all applications

TECHNICAL DATA

- Type of liquid: clean water, light chemical treatment
- Maximum working pressure: 16 bar
- Temperature of the liquid:
  - from 0°C to +80°C (standard)
  - from -20°C to +120°C (high temperature version)
- DIN PN16 suction and discharge connection
- Various supplier for motors
- Self-ventilated 2 and 4 pole asynchronous motor
- Class of insulation F (B for high tempertaures)
- IP 55 protection rating
- 220÷240/380÷415V ± 5% (up to 4 kW included), 50Hz three-phase voltage, 380÷415/660÷720V ±5% (5.5 kW and over), 50Hz three-phase voltage

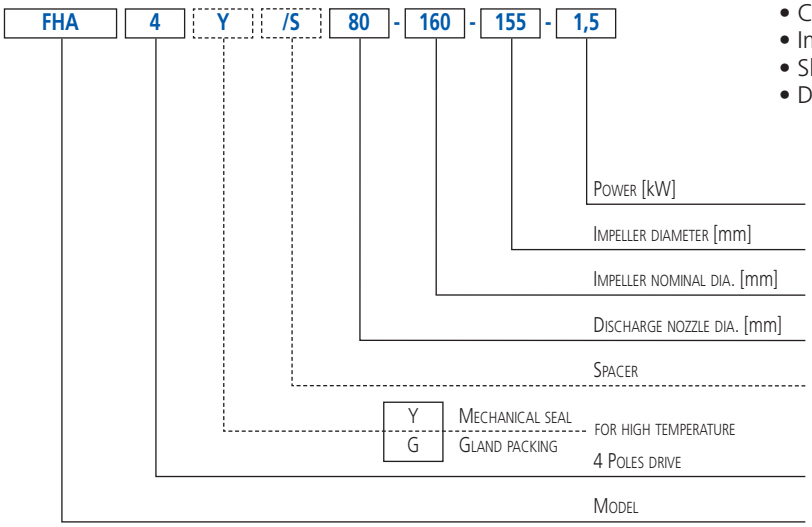
MATERIALS

- Casing in cast iron
- Impeller in bronze
- Shaft in AISI 403
- Mechanical seal in Ceramic/Carbon/NBR

ON REQUEST

- Priming funnel; valve; companion flange; gasket
- Flange: JIS 16K or ANSI 250
- Casing in ductile cast iron (GJS400)
- Impeller in cast iron or in ductile cast iron (GJS400)
- Shaft in AISI 304 or in AISI 316 stainless steel
- Diesel motor

IDENTIFICATION CODE



FHA

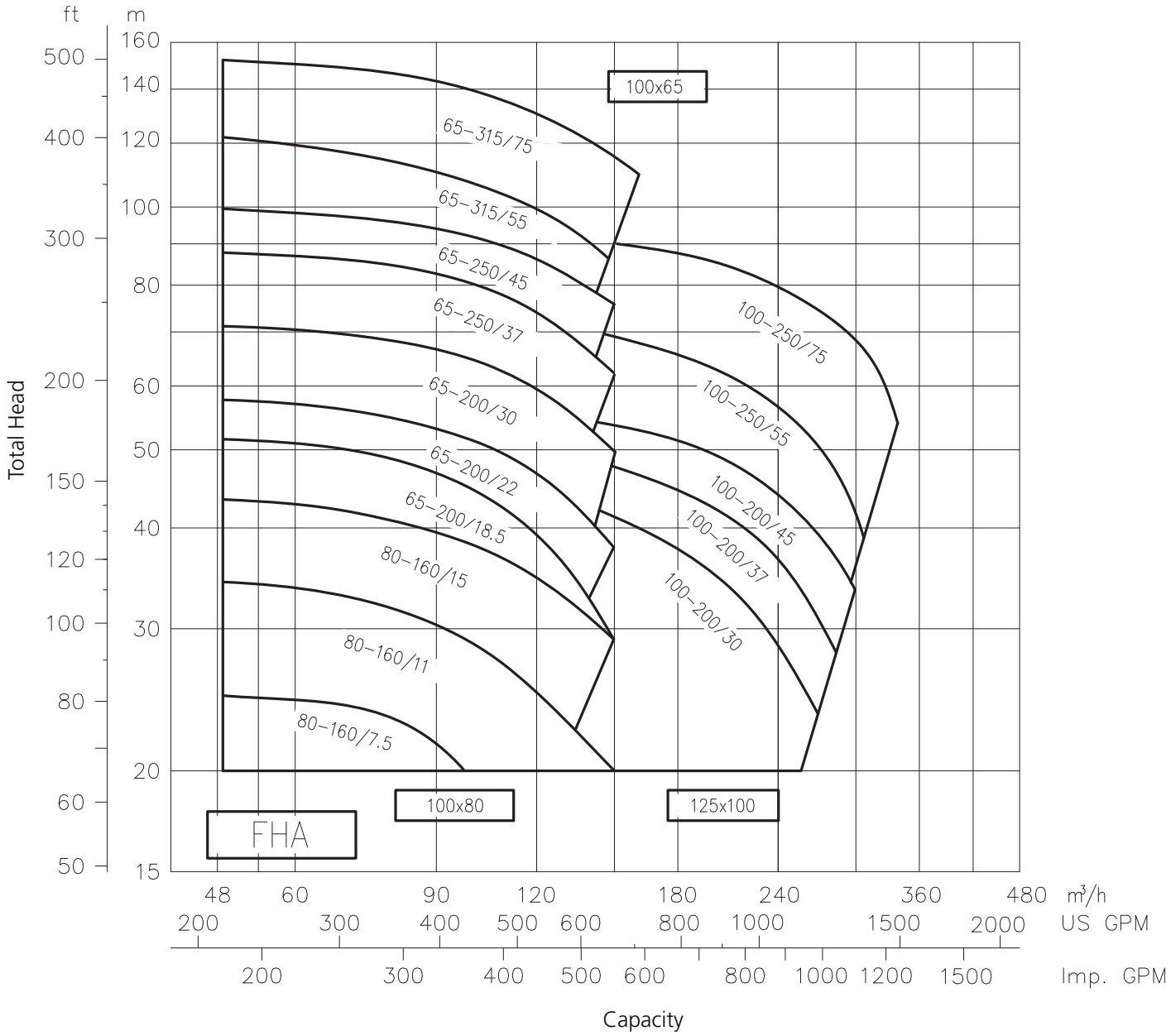
END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

FHA PERFORMANCE CHART

at 3000 min^{-1} (according to ISO 9906 Attachment A)

2 Poles



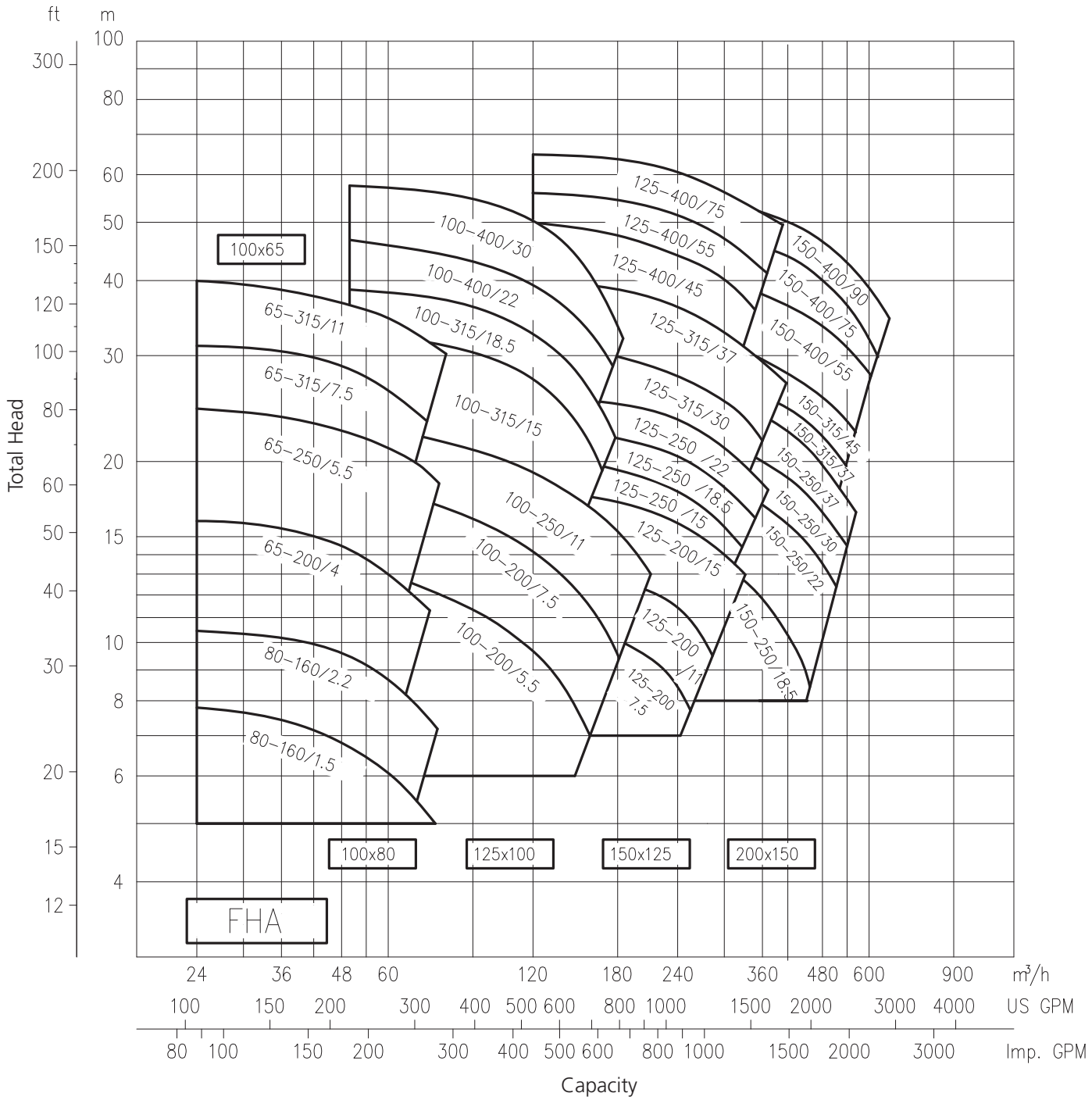
END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

FHA PERFORMANCE CHART

at 1500 min^{-1} (according to ISO 9906 Attachment A)

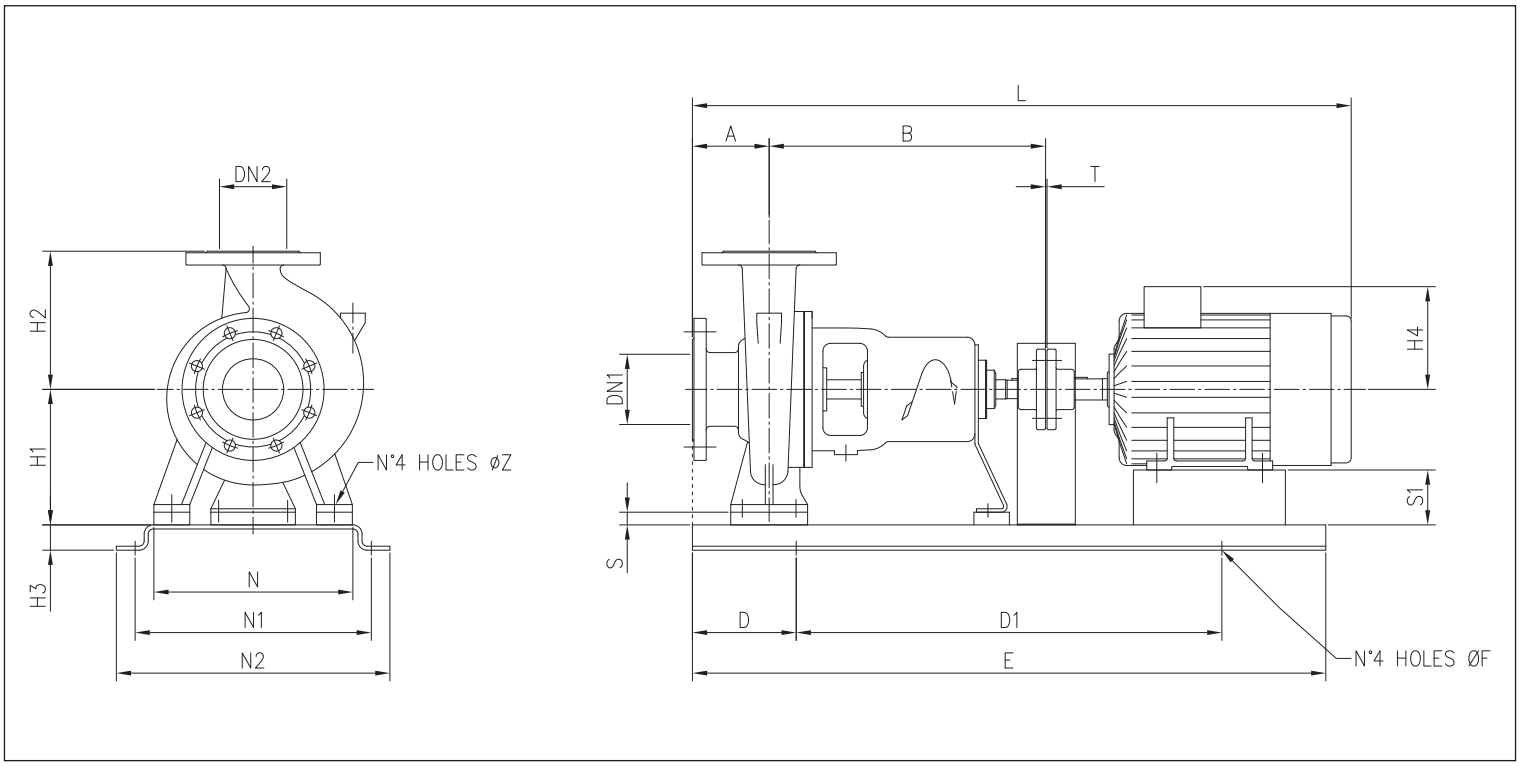
4 Poles



END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

DIMENSIONS - Pump + motor



FHA

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

DIMENSIONS TABLE

Model	Motor kW 4 Poles	Motor kW 2 Poles	Size	Dimensions [mm] DN1	DN2	A	B	D	D1	E	ØF	H1	H2	H3	H4	L	N	N1	N2	S	S1	T	Weight [kg]
FHA4 80-160	1,5	-	090L	100	80	100	500	190	740	1120	22	160	200	50	138	920	280	550	610	-	70	3	133,0
FHA4 80-160	2,2	-	100L	100	80	100	500	190	740	1120	22	160	200	50	145	969	280	550	610	-	60	3	139,0
FHA2 80-160	-	7,5	132S	100	80	100	500	190	740	1120	22	160	200	50	195	1045	280	550	610	-	28	3	165,0
FHA2 80-160	-	11	160M	100	80	100	500	190	740	1120	22	160	200	50	238	1213	280	550	610	-	-	3	201,0
FHA2 80-160	-	15	160M	100	80	100	500	190	740	1120	22	160	200	50	238	1213	280	550	610	-	-	3	217,0
FHA4 65-200	2,2	-	100L	100	65	100	500	190	740	1120	22	180	225	50	145	969	320	550	610	-	80	3	157,0
FHA4 65-200	4	-	112M	100	65	100	500	190	740	1120	22	180	225	50	161	991	320	550	610	-	68	3	165,0
FHA2 65-200	-	15	160M	100	65	100	500	190	740	1120	22	180	225	50	238	1213	320	550	610	-	20	3	243,0
FHA2 65-200	-	18,5	160L	100	65	100	500	190	740	1120	22	180	225	50	238	1257	320	550	610	-	20	3	244,0
FHA2 65-200	-	22	180M	100	65	100	500	190	740	1120	22	180	225	50	270	1273	320	550	610	-	-	3	304,0
FHA2 65-200	-	30	200L	100	65	100	500	230	940	1400	26	200	225	75	310	1374	320	550	610	20	-	4	396,0
FHA4 65-250	4	-	112M	100	65	125	500	190	740	1120	22	200	250	50	161	1016	360	550	610	-	88	3	177,0
FHA4 65-250	5,5	-	132S	100	65	125	500	190	740	1120	22	200	250	50	195	1070	360	550	610	-	68	3	202,0
FHA2 65-250	-	30	200L	100	65	125	500	230	940	1400	26	200	250	75	310	1399	360	550	610	-	-	4	406,0
FHA2 65-250	-	37	200L	100	65	125	500	230	940	1400	26	200	250	75	310	1399	360	550	610	-	-	4	424,0
FHA2 65-250	-	45	225M	100	65	125	500	230	940	1400	26	225	250	75	335	1429	360	550	610	25	-	4	486,0
FHA4 65-315	5,5	-	132S	100	65	125	530	230	940	1400	26	225	280	75	195	1100	400	550	610	-	93	3	256,0
FHA4 65-315	7,5	-	132M	100	65	125	530	230	940	1400	26	225	280	75	195	1140	400	550	610	-	93	3	266,0
FHA4 65-315	11	-	160M	100	65	125	530	230	940	1400	26	225	280	75	238	1268	400	550	610	-	65	3	312,0
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FHA2 65-315	-	55	250M	100	65	125	530	230	940	1400	26	250	280	75	370	1569	400	670	730	25	-	4	597,0
FHA2 65-315	-	75	280S	100	65	125	530	300	1200	1800	26	280	280	100	380	1619	400	670	730	55	-	4	760,0
FHA4 100-200	5,5	-	132S	125	100	125	500	190	740	1120	22	200	280	50	195	1070	360	550	610	-	68	3	196,0
FHA4 100-200	7,5	-	132M	125	100	125	500	190	740	1120	22	200	280	50	195	1110	360	550	610	-	68	3	206,0
FHA2 100-200	-	30	200L	125	100	125	500	230	940	1400	26	200	280	75	310	1399	360	550	610	-	-	4	400,0
FHA2 100-200	-	37	200L	125	100	125	500	230	940	1400	26	200	280	75	310	1399	360	550	610	-	-	4	418,0
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FHA2 100-250	-	45	225M	125	100	140	530	230	940	1400	26	225	280	75	335	1474	400	550	610	-	-	4	535,0
FHA2 100-250	-	55	250M	125	100	140	530	230	940	1400	26	250	280	75	370	1584	400	670	730	25	-	4	624,0
FHA2 100-250	-	75	280S	125	100	140	530	300	1200	1800	26	280	280	100	380	1634	400	670	730	55	-	4	787,0
FHA4 100-315	15	-	160L	125	100	140	530	230	940	1400	26	250	315	75	238	1327	400	550	610	-	90	3	372,0
FHA4 100-315	18,5	-	180M	125	100	140	530	230	940	1400	26	250	315	75	270	1343	400	550	610	-	70	3	433,0
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FHA4 125-200	11	-	160M	150	125	140	500	230	940	1400	26	250	315	75	238	1253	400	550	610	-	90	3	356,0
FHA4 125-200	15	-	160L	150	125	140	500	230	940	1400	26	250	315	75	238	1297	400	550	610	-	90	3	362,0
FHA4 125-250	15	-	160L	150	125	140	530	230	940	1400	26	250	355	75	238	1327	400	550	610	-	90	3	373,0
FHA4 125-250	18,5	-	180M	150	125	140	530	230	940	1400	26	250	355	75	270	1343	400	550	610	-	70	3	434,0
FHA4 125-250	22	-	180L	150	125	140	530	230	940	1400	26	250	355	75	270	1383	400	550	610	-	70	3	452,0
FHA4 125-315	22	-	180L	150	125	140	530	230	940	1400	26	280	355	75	270	1383	500	670	730	-	100	3	523,0
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FHA4 125-400	45	-	225M	150	125	140	530	230	940	1400	26	315	400	75	335	1504	500	670	730	-	90	4	716,0
FHA4 125-400	55	-	250M	150	125	140	530	300	1200	1800	26	315	400	100	370	1584	500	780	850	-	65	4	821,0
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FHA4 150-250	18,5	-	180M	200	150	160	530	230	940	1400	26	280	375	75	270	1363	500	670	730	-	100	3	520,0
FHA4 150-250	22	-	180L	200	150	160	530	230	940	1400	26	280	375	75	270	1403	500	670	730	-	100	3	538,0
FHA4 150-250	30	-	200L	200	150	160	530	230	940	1400	26	280	375	75	310	1464	500	670	730	-	80	4	614,0
FHA4 150-250	37	-	225S	200	150	160	530	230	940	1400	26	280	375	75	335	1499	500	670	730	-	55	4	651,0
FHA4 150-315	37	-	225S	200	150	160	670	300	1200	1800	26	315	400	100	335	1639	550	670	730	-	90	4	738,0
FHA4 150-315	45	-	225M	200	150	160	670	300	1200	1800	26	315	400	100	335	1664	550	670	730	-	90	4	771,0
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FHA4 150-400	45	-	225M	200	150	160	670	300	1200	1800	26	315	450	100	335	1664	550	670	730	-	90	4	820,0
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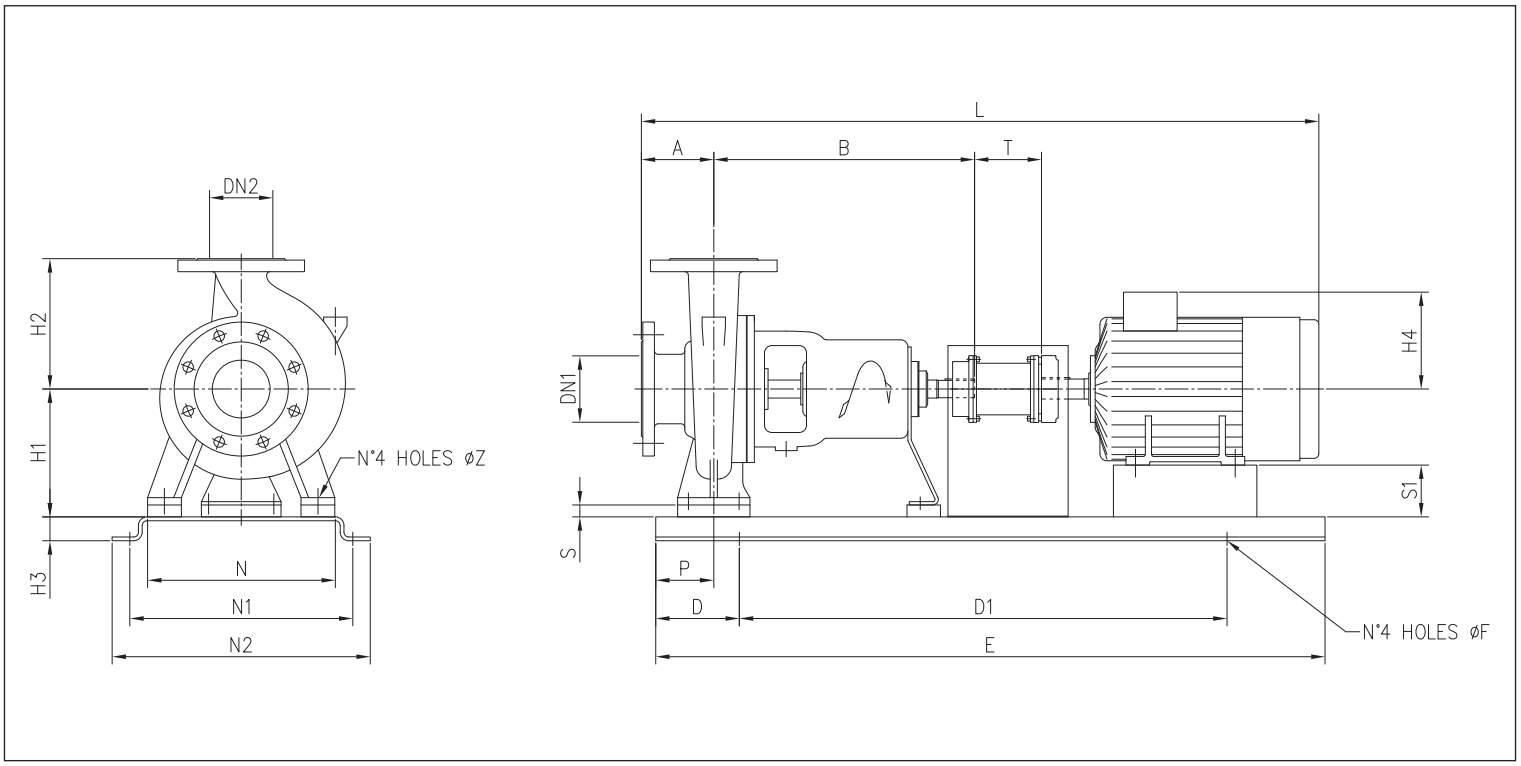
FHA4 150-400	75	-	280S	200	150	160	670	300	1200	1800	26	315	450	100	380	1794	550	780	850	-	35	4	1051,0
FHA4 150-400	90	-	280M	200	150	160	670	300	1200	1800	26	315	450	100	380	1849	550	780	850	-	35	4	1150,0

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

DIMENSIONS - Pump + motor with spacer



END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

DIMENSIONS TABLE

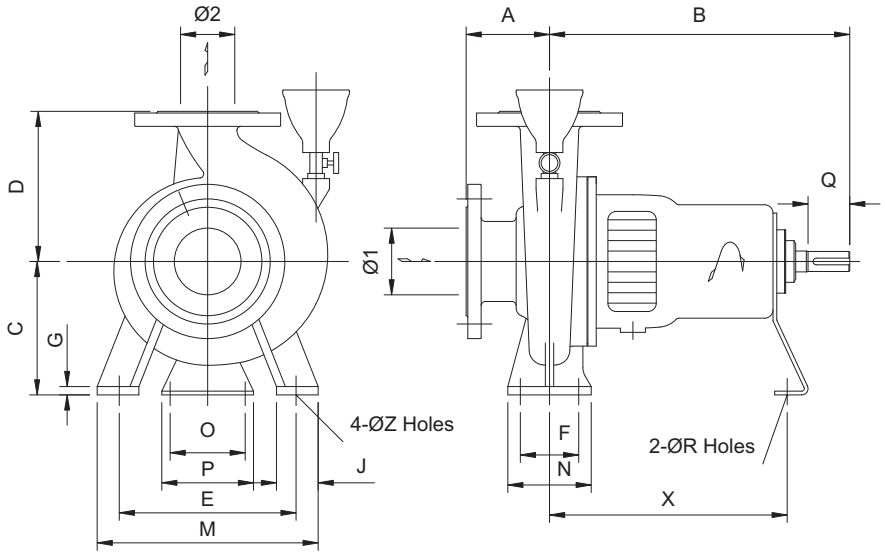
Model	Motor kW		Size	Dimensions [mm]																				Weight [kg]
	4 Poles	2 Poles		DN1	DN2	A	B	D	D1	E	ØF	H1	H2	H3	H4	L	N	N1	N2	S	S1	T	P	
FHA4/S 80-160	1,5	-	090L	100	80	100	500	190	740	1120	22	160	200	50	138	1057	280	550	610	-	70	140	100	135,0
FHA4/S 80-160	2,2	-	100L	100	80	100	500	190	740	1120	22	160	200	50	145	1106	280	550	610	-	60	140	100	141,0
FHA2/S 80-160	-	7,5	132S	100	80	100	500	230	940	1400	26	160	200	75	195	1182	280	550	610	-	28	140	100	198,0
FHA2/S 80-160	-	11	160M	100	80	100	500	230	940	1400	26	160	200	75	238	1350	280	550	610	-	-	140	100	234,0
FHA2/S 80-160	-	15	160M	100	80	100	500	230	940	1400	26	160	200	75	238	1350	280	550	610	-	-	140	100	250,0
FHA4/S 65-200	2,2	-	100L	100	65	100	500	190	740	1120	22	180	225	50	145	1106	320	550	610	-	80	140	100	158,0
FHA4/S 65-200	4	-	112M	100	65	100	500	190	740	1120	22	180	225	50	161	1128	320	550	610	-	68	140	100	166,0
FHA2/S 65-200	-	15	160M	100	65	100	500	230	940	1400	26	180	225	75	238	1350	320	550	610	-	20	140	100	276,0
FHA2/S 65-200	-	18,5	160L	100	65	100	500	230	940	1400	26	180	225	75	238	1394	320	550	610	-	20	140	100	277,0
FHA2/S 65-200	-	22	180M	100	65	100	500	230	940	1400	26	180	225	75	270	1410	320	550	610	-	-	140	100	337,0
FHA2/S 65-200	-	30	200L	100	65	100	500	230	940	1400	26	200	225	75	310	1510	320	550	610	20	-	140	100	399,0
FHA4/S 65-250	4	-	112M	100	65	125	500	190	740	1120	22	200	250	50	161	1153	360	550	610	-	88	140	125	178,0
FHA4/S 65-250	5,5	-	132S	100	65	125	500	230	940	1400	26	200	250	75	195	1207	360	550	610	-	68	140	125	235,0
FHA2/S 65-250	-	30	200L	100	65	125	500	230	940	1400	26	200	250	75	310	1535	360	550	610	-	-	140	125	409,0
FHA2/S 65-250	-	37	200L	100	65	125	500	230	940	1400	26	200	250	75	310	1535	360	550	610	-	-	140	125	427,0
FHA2/S 65-250	-	45	225M	100	65	125	500	230	940	1400	26	225	250	75	335	1565	360	550	610	25	-	140	125	489,0
FHA4/S 65-315	5,5	-	132S	100	65	125	530	230	940	1400	26	225	280	75	195	1237	400	550	610	-	93	140	125	258,0
FHA4/S 65-315	7,5	-	132M	100	65	125	530	230	940	1400	26	225	280	75	195	1277	400	550	610	-	93	140	125	268,0
FHA4/S 65-315	11	-	160M	100	65	125	530	230	940	1400	26	225	280	75	238	1405	400	550	610	-	65	140	125	314,0
FHA2/S 65-315	-	45	225M	100	65	125	530	300	1200	1800	26	225	280	100	335	1595	400	670	730	-	-	140	125	557,0
FHA2/S 65-315	-	55	250M	100	65	125	530	300	1200	1800	26	250	280	100	370	1705	400	670	730	25	-	140	120	635,0
FHA2/S 65-315	-	75	280S	100	65	125	530	300	1200	1800	26	280	280	100	380	1755	400	670	730	55	-	140	185	766,0
FHA4/S 100-200	5,5	-	132S	125	100	125	500	230	940	1400	26	200	280	75	195	1207	360	550	610	-	68	140	125	229,0
FHA4/S 100-200	7,5	-	132M	125	100	125	500	230	940	1400	26	200	280	75	195	1247	360	550	610	-	68	140	125	239,0
FHA2/S 100-200	-	30	200L	125	100	125	500	230	940	1400	26	200	280	75	310	1535	360	550	610	-	-	140	125	403,0
FHA2/S 100-200	-	37	200L	125	100	125	500	230	940	1400	26	200	280	75	310	1535	360	550	610	-	-	140	125	421,0
FHA2/S 100-200	-	45	225M	125	100	125	500	230	940	1400	26	225	280	75	335	1565	360	550	610	25	-	140	125	483,0
FHA2/S 100-200	-	55	250M	125	100	125	500	300	1200	1800	26	250	280	100	370	1675	360	670	730	50	-	140	125	607,0
FHA4/S 100-250	5,5	-	132S	125	100	140	530	230	940	1400	26	225	280	75	195	1252	400	550	610	-	93	140	140	285,0
FHA4/S 100-250	7,5	-	132M	125	100	140	530	230	940	1400	26	225	280	75	195	1292	400	550	610	-	93	140	140	295,0
FHA4/S 100-250	11	-	160M	125	100	140	530	230	940	1400	26	225	280	75	238	1420	400	550	610	-	65	140	140	341,0
FHA2/S 100-250	-	45	225M	125	100	140	530	300	1200	1800	26	225	280	100	335	1610	400	670	730	-	-	140	140	584,0
FHA2/S 100-250	-	55	250M	125	100	140	530	300	1200	1800	26	250	280	100	370	1720	400	670	730	25	-	140	120	662,0
FHA2/S 100-250	-	75	280S	125	100	140	530	300	1200	1800	26	280	280	100	380	1770	400	670	730	55	-	140	185	793,0
FHA4/S 100-315	15	-	160L	125	100	140	530	230	940	1400	26	250	315	75	238	1464	400	550	610	-	90	140	140	374,0
FHA4/S 100-315	18,5	-	180M	125	100	140	530	230	940	1400	26	250	315	75	270	1480	400	550	610	-	70	140	140	436,0
FHA4/S 100-400	22	-	180L	125	100	140	530	230	940	1400	26	280	355	75	270	1520	500	670	730	-	100	140	140	520,0
FHA4/S 100-400	30	-	200L	125	100	140	530	300	1200	1800	26	280	355	100	310	1580	500	670	730	-	80	140	140	624,0
FHA4/S 125-200	7,5	-	132M	150	125	140	500	230	940	1400	26	250	315	75	195	1262	400	550	610	-	118	140	140	311,0
FHA4/S 125-200	11	-	160M	150	125	140	500	230	940	1400	26	250	315	75	238	1390	400	550	610	-	90	140	140	358,0
FHA4/S 125-200	15	-	160L	150	125	140	500	230	940	1400	26	250	315	75	238	1434	400	550	610	-	90	140	140	364,0
FHA4/S 125-250	15	-	160L	150	125	140	530	230	940	1400	26	250	355	75	238	1464	400	550	610	-	90	140	140	374,0
FHA4/S 125-250	18,5	-	180M	150	125	140	530	230	940	1400	26	250	355	75	270	1480	400	550	610	-	70	140	140	437,0
FHA4/S 125-250	22	-	180L	150	125	140	530	230	940	1400	26	250	355	75	270	1520	400	550	610	-	70	140	140	455,0
FHA4/S 125-315	22		180L	150	125	140	530	230	940	1400	26	280	355	75	270	1520	500	670	730	-	100	140	140	525,0
FHA4/S 125-315	30	-	200L	150	125	140	530	300	1200	1800	26	280	355	100	310	1580	500	670	730	-	80	140	140	631,0
FHA4/S 125-315	37	-	225S	150	125	140	530	300	1200	1800	26	280	355	100	335	1615	500	670	730	-	55	140	140	671,0
FHA4/S 125-400	45	-	225M	150	125	140	530	300	1200	1800	26	315	400	100	335	1640	500	670	730	-	90	140	140	754,0
FHA4/S 125-400	55	-	250M	150	125	140	530	300	1200	1800	26	315	400	100	370	1720	500	780	850	-	65	140	140	827,0
FHA4/S 125-400	75	-	280S	150	125	140	530	300	1200	1800	26	315	400	100	380	1770	500	780	850	-	35	140	140	989,0
FHA4/S 150-250	18,5	-	180M	200	150	160	530	300	1200	1800	26	280	375	100	270	1540	500	670	730	-	100	180	160	555,0
FHA4/S 150-250	22	-	180L	200	150	160	530	300	1200	1800	26	280	375	100	270	1580	500	670	730	-	100	180	160	573,0
FHA4/S 150-250	30	-	200L	200	150	160	530	300	1200	1800	26	280	375	100	310	1640	500	670	730	-	80	180	160	649,0
FHA4/S 150-250	37	-	225S	200	150	160	530	300	1200	1800	26	280	375	100	335	1675	500	670	730	-	55	180	160	688,0
FHA4/S 150-315	37	-	225S	200	150	160	670	300	1200	1800	26	315	400	100	335	1815	550	670	730	-	90	180	160	743,0
FHA4/S 150-315	45	-	225M	200	150	160	670	300	1200	1800	26	315	400	100	335	1840	550	670	730	-	90	180	160	776,0
FHA4/S 150-315	55	-	250M	200	150	160	670	300	1200	1800	26	315	400	100	370	1920	550	780	850	-	65	180	160	850,0
FHA4/S 150-400	45	-	225M	200	150	160	670	300	1200	1800	26	315	450	100	335	1840	550	780	850	-	90	180	160	843,0
FHA4/S 150-400	55	-	250M	200	150	160	670	300	1200	1800	26	315	450	100	370	1920	550	780	850	-	65	180	160	897,0
FHA4/S 150-400	75	-	280S	200	150	160	670	300	1200	1800	26	315	450	100	380	1970	550	780	850	-	35	180	130	1059,0
FHA4/S 150-400	90	-	280M	200	150	160	670	300	1200	1800	26	315	450	100	380	2025	550	780	850	-	35	180	130	1158,0

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

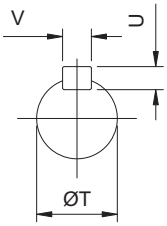
in cast iron

DIMENSIONS - Bare shaft pump

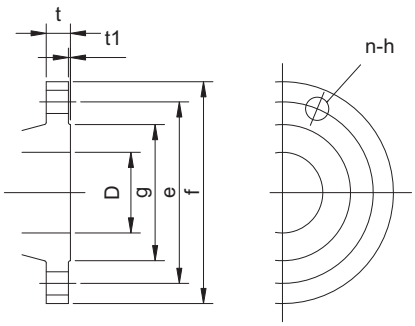
Pump



Shaft End



Flange



DIMENSIONS TABLE

Flange DIN PN16 dimensions [mm]							
D	f	e	g	t1	t	n	h
65	185	145	122	3	20	4	18
80	200	160	138	3	22	8	18
100	220	180	158	3	24	8	18
125	250	210	188	3	26	8	18
150	285	240	212	3	26	8	22
200	340	295	268	3	30	12	22

DIMENSIONS TABLE

Model	Size		Pump dimensions [mm]															Shaft dimensions [mm]				Weight
	ø1	ø2	A	B	C	D	E	F	G	J	M	N	O	P	R	X	Z	T	Q	U	V	[kg]
FHA 65-200	100	65	100	500	180	225	250	95	15	65	320	125	110	150	17	370	15	32	80	8	10	81,0
FHA 65-250	100	65	125	500	200	250	280	120	15	80	360	160	110	150	17	370	19	32	80	8	10	91,0
FHA 65-315	100	65	125	530	225	280	315	120	16	80	400	160	110	150	17	370	19	42	110	8	12	113,0
FHA 80-160*	100	80	100	500	160	200	212	95	14	65	280	125	110	150	17	370	15	32	80	8	10	64,0
FHA 100-200	125	100	125	500	200	280	280	120	14	80	360	160	110	150	17	370	19	32	80	8	10	85,0
FHA 100-250	125	100	140	530	225	280	315	120	16	80	400	160	110	150	17	370	19	42	110	8	12	140,0
FHA 100-315	125	100	140	530	250	315	315	120	16	80	400	160	110	150	17	370	19	42	110	8	12	166,0
FHA 100-400	125	100	140	530	280	355	400	150	20	100	500	200	110	150	17	370	24	42	110	8	12	218,0
FHA 125-200**	150	125	140	500	250	315	315	120	15	80	400	160	110	150	17	370	19	32	80	8	10	156,0
FHA 125-250	150	125	140	530	250	355	315	120	16	80	400	160	110	150	17	370	19	42	110	8	12	167,0
FHA 125-315	150	125	140	530	280	355	400	150	16	100	500	200	110	150	17	370	24	42	110	8	12	221,0
FHA 125-400	150	125	140	530	315	400	400	150	20	100	500	200	110	150	17	370	24	42	110	8	12	267,0
FHA 150-250	200	150	160	530	280	375	400	150	18	100	500	200	110	150	17	370	24	42	110	8	12	238,0
FHA 150-315	200	150	160	670	315	400	450	150	20	100	550	200	140	180	19	500	24	48	110	9	14	289,0
FHA 150-400	200	150	160	670	315	450	450	150	20	100	550	200	140	180	19	500	24	48	110	9	14	336,0

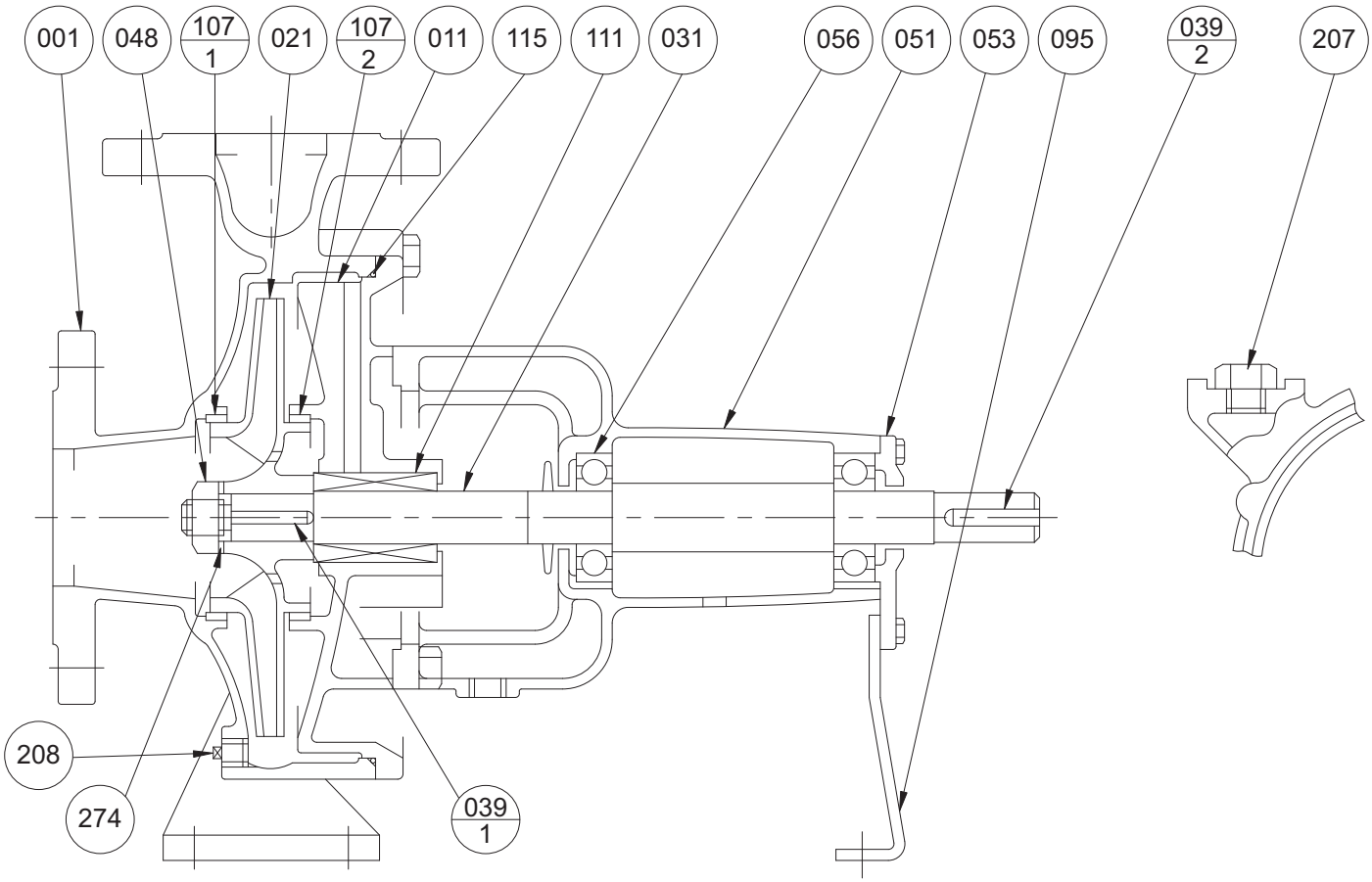
*= Dimensions not corresponding to ISO 2858
**= Additional model not included as standard

FHA

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

SECTIONAL VIEW



MATERIALS TABLE

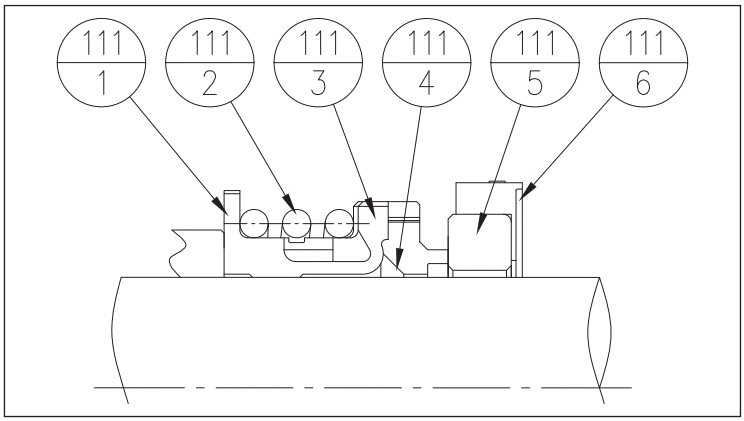
Ref.	Name	Material	Ref.	Name	Material
001	Casing	Cast Iron	056	Ball Bearing	-
011	Casing Cover	Cast Iron	095	Stay	Steel
021	Impeller	Bronze	107-1	Liner Ring	Bronze
031	Shaft	Stainless Steel	107-2	Liner Ring	Bronze
039-1	Impeller Key	Steel	111	Mechanical Seal	Ceramic/Carbon/NBR
039-2	Key	Steel	115	O-Ring [1]	NBR
048	Impeller Nut	Brass	207	Plug	Steel
051	Bearing Housing	Cast Iron	208	Plug	Steel
053	Bearing Cover	Cast Iron	274	Impeller Nut Washer	Steel

[1]= In EPDM for Y and G versions

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

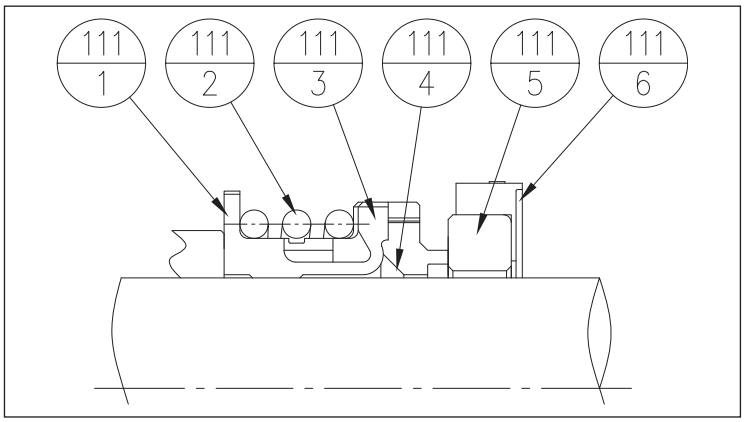
MECHANICAL SEAL standard



MATERIALS TABLE

Ref.	Name	Material
111-6	Cup Gasket	NBR
111-5	Mating Ring	Ceramic
111-4	Seal Ring	Carbon
111-3	Bellows	EPDM
111-2	Spring	Stainless Steel
111-1	Spring Holder	Stainless Steel

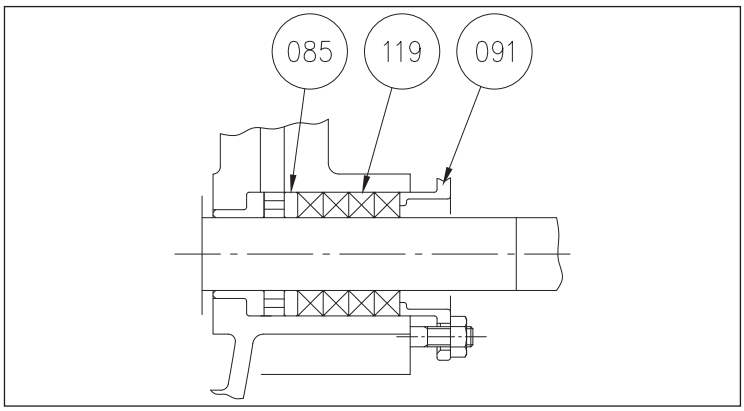
MECHANICAL SEAL Y version (for high temperature)



MATERIALS TABLE

Ref.	Name	Material
111-6	Cup Gasket	EPDM
111-5	Mating Ring	SiC
111-4	Seal Ring	Carbon
111-3	Bellows	EPDM
111-2	Spring	Stainless Steel
111-1	Spring Holder	Stainless Steel

GLAND PACKING G version (for high temperature)



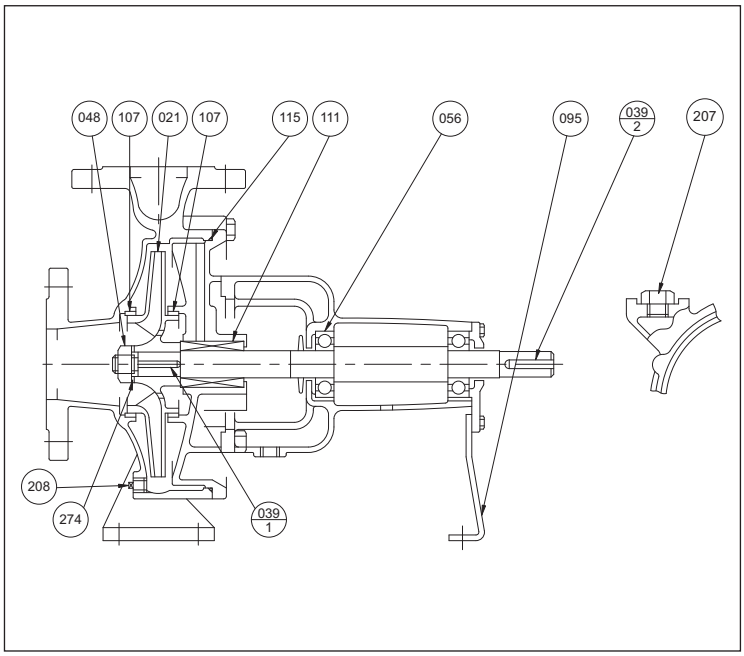
MATERIALS TABLE

Ref.	Name	Material
119	Gland	Teflon Impregnated
091	Gland Packing	Bronze
085	Lantern Ring	Bronze

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

SPARE PARTS



MATERIALS TABLE

Recommended spare parts stock for 2 years' continus operation

Ref.	Name	Q.ty/Unit
021	Impeller	1
039-1	Impeller key	1
039-2	Key	1
048	Impeller nut	1
056	Ball bearing	2
095	Stay	1
107	Liner ring	2
111	Mechanical seal / Gland packing	1
115	O-Ring	1
207/208	Plug	4
274	Impeller nut washer	1

CHANGEABILITY CHART

Part name	Casing	Casing cover	Impeller	Shaft	Impeller key	Key	Impeller nut	Bearing housing	Bearing cover	Ball bearing	Stay	Liner ring	Mechanical seal/ Gland packing	O-Ring	Impeller nut washer
Model	001	011	021	031	039-1	039-2	048	051	053	056	095	107	111	115	274
FHA 65-200	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FHA 65-250	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1
FHA 65-315	3	3	3	2	1	2	2	2	2	2	2	1	2	3	2
FHA 80-160	4	4	4	3	2	1	3	1	1	1	1	2	3	4	3
FHA 100-200	5	5	5	1	1	1	1	1	1	1	1	3	1	1	1
FHA 100-250	6	6	6	2	3	2	2	2	2	2	2	3	2	2	2
FHA 100-315	7	7	7	4	1	2	1	2	2	2	2	4	3	3	4
FHA 100-400	8	8	8	5	4	2	2	2	2	2	2	4	2	5	5
FHA 125-200	9	9	9	1	1	1	1	1	1	1	1	4	1	1	1
FHA 125-250	10	10	10	4	1	2	1	2	2	2	2	5	2	2	4
FHA 125-315	11	11	11	5	4	2	2	2	2	2	2	6	3	3	5
FHA 125-400	12	12	12	5	4	2	2	2	2	2	2	6	2	4	5
FHA 150-250	13	13	13	5	4	2	2	2	2	2	2	7	2	2	5
FHA 150-315	14	14	14	6	5	3	4	3	3	3	3	8	4	3	6
FHA 150-400	15	15	15	6	5	3	4	3	3	3	3	8	4	5*	6

*=Sheet packing

The chart shows the part list (main parts) of FHA pumps, and each part is designated by a number. (1,2,3,...)

Parts designated by the same number and placed in the same column means that these parts are changeable among these pumps sizes.

FHA

END SUCTION VOLUTE PUMPS ISO 2858 (EX DIN 24256)

in cast iron

SPECIFIC PERFORMANCE

The specifications given refer to the curves illustrated in our catalogues and Data Book (see www.ebaraeurope.com).
All of the performance curves are calculated according to ISO 9906 Attachment A.

Tolerance according to ISO 9906 Annex A.
The curves refer to an effective speed of the 50 Hz asynchronous motors.
The measurements are made with water temperature of 20°C and cinematic viscosity of = 1 mm^2/s (1 cSt).
In order to prevent the risk of overheating, the pumps must not be used at a flow rate below 10% of the maximum efficiency flow rate.
During selection of the pumps, there is a safety margin of at least 1 m.

Symbols: Q = Flow rate [m^3/h]
H = Head [m]
P_1 = Power absorbed by the electric line
P_2 = Power yielded to the motor axis (power absorbed by the pump)

PRESSURE LOSS TABLE

Pressure drop (Pc) in metres of column of water for every one hundred metres of new cast iron pipe. Speed of the liquid in the pipe in metres/second.

Flow rate [m³/h]		Internal diameter [mm]																										
		25	32	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	450	500	600	700	800	900	1000
3	Pc % Vm/s	17 1,70	6 1,03	1,6 0,67	0,54 0,43	0,25 0,29	0,13 0,22	0,06 0,16	0,03 0,13	0,02 0,10																		
6	Pc % Vm/s		24 2,06	6 1,34	2 0,85	0,9 0,58	0,43 0,44	0,21 0,32	0,13 0,26	0,08 0,20	0,026 0,13																	
9	Pc % Vm/s			12,5 2,08	4,3 1,32	1,8 0,89	0,9 0,65	0,46 0,5	0,25 0,39	0,15 0,32	0,06 0,20																	
12	Pc % Vm/s			20 2,76	7 1,76	3,2 1,19	1,5 0,88	0,75 0,67	0,44 0,53	0,25 0,43	0,09 0,27	0,03 0,18																
15	Pc % Vm/s				12 2,2	5,2 1,49	2,4 1,1	1,25 0,87	0,7 0,66	0,42 0,54	0,15 0,34	0,06 0,24																
18	Pc % Vm/s				17 2,64	7 1,78	3,5 1,3	1,7 1	1 0,78	0,6 0,64	0,2 0,4	0,08 0,28																
21	Pc % Vm/s				22 3,35	8,8 2,08	4,2 1,54	2,2 1,17	1,3 0,93	0,75 0,75	0,26 0,48	0,1 0,32	0,05 0,24															
24	Pc % Vm/s					12 2,38	5,7 1,76	3 1,34	1,7 1,06	1 0,86	0,36 0,54	0,14 0,36	0,07 0,28															
27	Pc % Vm/s					14 2,7	7 1,97	3,5 1,45	2 1,17	1,25 0,96	0,42 0,6	0,17 0,42	0,08 0,31															
30	Pc % Vm/s					17 2,98	8,2 2,2	4,2 1,74	2,5 1,32	1,5 1,08	0,5 0,68	0,2 0,48	0,09 0,34															
36	Pc % Vm/s					25 3,58	12 2,63	6,3 2	3,5 1,58	2 1,28	0,75 0,82	0,3 0,57	0,14 0,42	0,07 0,32														
42	Pc % Vm/s						16 3,07	8,5 2,34	4,5 1,85	2,7 1,5	0,85 0,96	0,33 0,66	0,18 0,48	0,08 0,37														
48	Pc % Vm/s						21 3,51	10 2,68	6 2,12	3,6 1,72	1,2 1,08	0,45 0,72	0,22 0,56	0,12 0,43	0,06 0,34													
54	Pc % Vm/s						25 3,94	13,5 3	7,6 2,34	4,5 1,92	1,5 1,2	0,55 0,84	0,28 0,63	0,14 0,48	0,08 0,38													
60	Pc % Vm/s							16 3,32	9 2,64	5,5 2,16	1,8 1,36	0,7 0,96	0,33 0,68	0,17 0,53	0,1 0,42													
75	Pc % Vm/s							24 4,17	14 3,31	8 2,68	2,76 1,72	1 1,18	0,49 0,87	0,24 0,67	0,14 0,53	0,08 0,43												
90	Pc % Vm/s								20 3,97	12,5 3,24	3,8 2,04	1,45 1,44	0,74 1,02	0,36 0,8	0,2 0,63	0,14 0,51	0,08 0,42											
105	Pc % Vm/s								26 4,6	16,5 3,74	5,3 2,41	1,95 1,66	0,9 1,22	0,47 0,93	0,27 0,74	0,16 0,59	0,1 0,49											
120	Pc % Vm/s									21,5 4,31	6,9 2,72	2,6 1,93	1,2 1,35	0,61 1,06	0,36 0,84	0,2 0,68	0,14 0,56	0,08 0,47										
135	Pc % Vm/s									26 4,81	9 1,07	3,3 2,13	1,5 1,56	0,76 1,19	0,45 0,95	0,25 0,76	0,17 0,63	0,1 0,53										
150	Pc % Vm/s										11 3,44	4 2,36	1,9 1,74	0,95 1,34	0,55 1,05	0,3 0,86	0,21 0,70	0,12 0,59	0,06 0,43									
165	Pc % Vm/s										13 3,75	4,7 2,61	2,2 1,91	1,13 1,46	0,65 1,15	0,37 0,94	0,24 0,77	0,15 0,65	0,08 0,48									
180	Pc % Vm/s										15,2 4,09	5,5 2,83	2,6 2,08	1,3 1,59	0,76 1,26	0,43 1,02	0,29 0,84	0,18 0,71	0,09 0,52									
210	Pc % Vm/s										21 4,70	7,4 3,32	3,5 2,43	1,8 1,86	1,1 1,49	0,6 1,19	0,37 0,98	0,24 0,82	0,12 0,61	0,06 0,47								
240	Pc % Vm/s											9,4 3,78	4,3 2,77	2,3 2,12	1,3 1,68	0,75 1,36	0,48 1,12	0,3 0,95	0,15 0,69	0,08 0,53								
270	Pc % Vm/s											12 4,26	5,5 3,13	2,8 2,39	1,62 1,90	0,9 1,53	0,58 1,26	0,35 1,07	0,18 0,78	0,09 0,59								
300	Pc % Vm/s											14 4,75	7,5 3,47	3,4 2,66	2 2,10	1,1 1,71	0,74 1,40	0,46 1,18	0,22 0,86	0,11 0,67	0,07 0,53							
360	Pc % Vm/s												9 4,15	4,7 3,17	2,8 2,53	1,6 2,04	1 1,68	0,65 1,41	0,32 1,04	0,16 0,79	0,09 0,63	0,05 0,51						
420	Pc % Vm/s												11,6 4,86	6,2 3,72	3,5 2,94	2 2,37	1,3 1,96	0,82 1,64	0,41 1,22	0,21 0,94	0,12 0,76	0,07 0,59	0,03 0,41					
480	Pc % Vm/s													8,5 4,24	4,9 3,36	2,9 2,72	1,9 2,24	1,2 1,90	0,6 1,38	0,3 1,06	0,17 0,84	0,09 0,69	0,04 0,47					
540	Pc % Vm/s													11 4,78	6,5 3,80	3,7 3,06	2,35 2,52	1,52 2,13	0,75 1,56	0,38 1,19	0,22 0,94	0,12 0,76	0,05 0,53					
600	Pc % Vm/s													12,2 5,30	7,4 4,20	4,3 3,40	2,7 2,81	1,7 2,36	0,9 1,73	0,45 1,34	0,25 1,06	0,13 0,86	0,055 0,61	0,024 0,44				
660	Pc % Vm/s														9 4,61	5,2 3,76	3,3 3,07	2,1 2,59	1,1 1,89	0,54 1,46	0,3 0,15	0,16 0,93	0,06 0,65	0,03 0,48			
720	Pc % Vm/s														10 5,05	6 4,08	3,8 3,37	2,5 2,84	1,3 2,08	0,52 1,65	0,35 1,26	0,19 1,02	0,075 0,71	0,035 0,52			
780	Pc % Vm/s															7,3 4,43	4,5 3,65	3 3,08	1,5 2,26	0,75 1,73	0,42 1,36	0,23 1,11	0,08 0,77	0,04 0,56			
840	Pc % Vm/s															8 4,76	5,4 3,95	3,4 3,31	1,7 2,43	0,85 1,86	0,48 1,47	0,26 1,19	0,1 0,83	0,047 0,61			
900	Pc % Vm/s															9 5,1	5,8 4,22	3,75 3,54	1,9 2,60	0,96 2,00	0,53 1,57	0,29 1,27	0,11 0,88	0,053 0,65			
960	Pc % Vm/s																6,5 4,49	4,3 3,78	2,1 2,77	1,1 2,13	0,6 1,68	0,32 1,36	0,12 0,95	0,06 0,70			
1020	Pc % Vm/s																7,2 4,76	4,6 4,01	2,45 2,94	1,2 2,26	0,67 1,78	0,35 1,44	0,14 1,00	0,065 0,77	0,033 0,54		
1080	Pc % Vm/s																	5,4 4,26	2,8 3,12	1,4 2,38	0,78 1,86	0,43 1,53	0,16 1,06	0,073 0,78	0,037 0,57		
1140	Pc % Vm/s																	6 4,49	3,2 3,29	1,53 2,53	0,86 1,99	0,46 1,65	0,175 1,12	0,08 0,84	0,043 0,61	0,037 0,52	
1200	Pc % Vm/s																	6,5 4,72	3,4 3,45	1,7 2,68	0,93 2,12	0,5 1,72	0,19 1,23	0,09 0,88	0,046 0,63	0,04 0,54	0,025 0,4

It is possible to estimate the pressure drops caused by accessories with the following comparisons:

- Foot valve: like 15 m of piping
- Non-return valve: like 10 m of piping
- Gate: like 5 m of piping
- Bends and elbows: like 5 m of piping

For piping different to the new cast iron ones, multiply the table data for the following coefficients:

- stainless steel 0,8
- PVC 0,7
- gres 1,17
- rolled steel 0,8
- galvanised steel 0,8
- slightly rusty pipes 1,25
- rust pipes with a lot of deposits 2,1

Recommended discharge diameter

Recommended suction diameter

NOTES

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