

**50 Hz**



# Z612, Z616, Z622 Z631, Z646, Z660 Series

6" SUBMERSIBLE  
ELECTRIC PUMPS

**ErP 2009/125/EC**

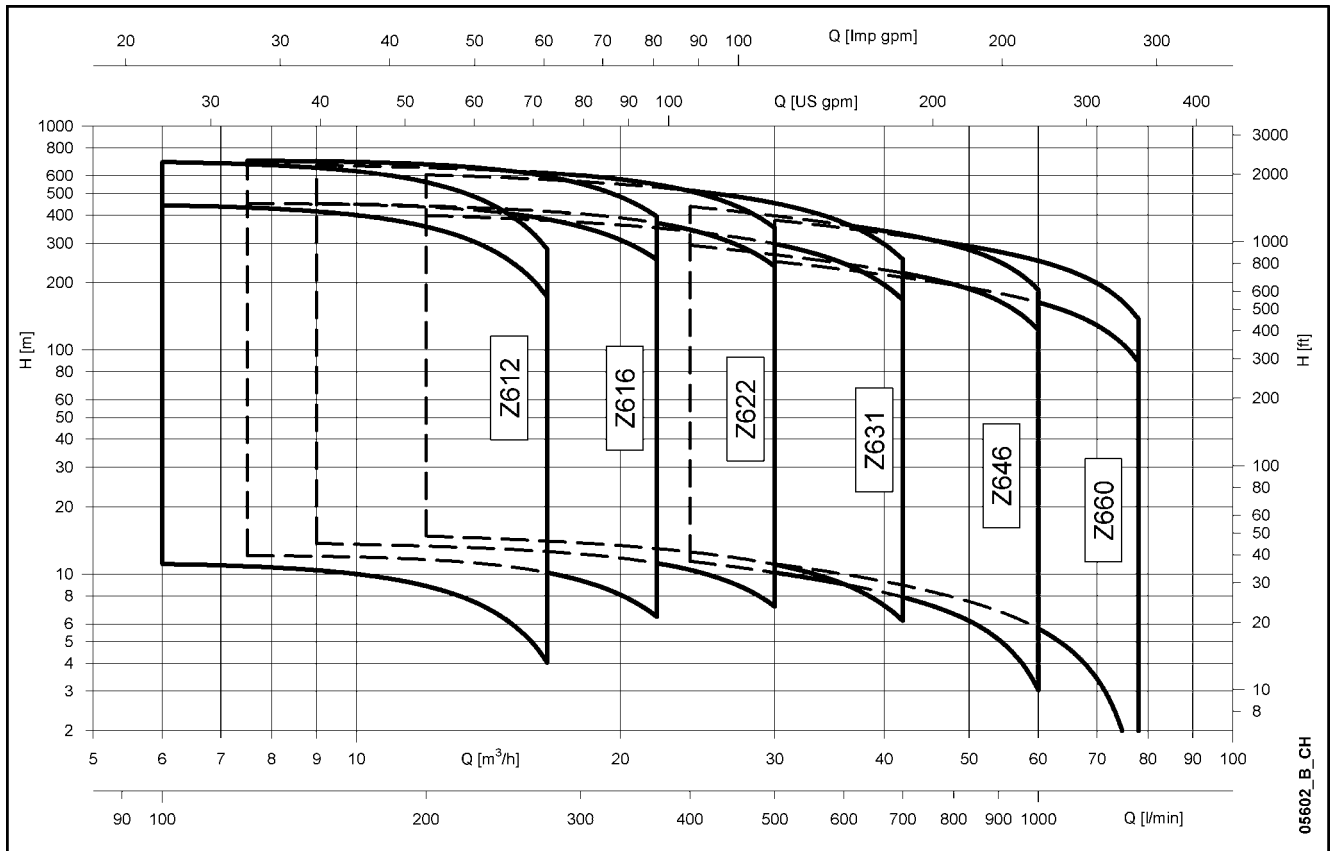
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 **LOWARA**  
a xylem brand



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**Z612, Z616, Z622, Z631, Z646, Z660 SERIES  
HYDRAULIC PERFORMANCE RANGE**


05602\_B\_CH

## 6" Submersible Electric Pumps

**Z612, Z616  
Z622, Z631  
Z646, Z660  
Series**

### MARKET SECTORS

RESIDENTIAL, AGRICULTURE, INDUSTRY.

### APPLICATIONS

- Water supply from deep wells.
- Pressure boosting and water distribution
- Supply of surge tanks and reservoirs.
- Firefighting and washing systems.
- Water table level control.
- Irrigation.
- Mines.



### SPECIFICATIONS

- **Delivery:** up to 78 m<sup>3</sup>/h.
- **Head:** up to 700 m.
- **Maximum overall diameter of pump:**
  - Standard version: 142 mm (one cable guard included).
  - High head version:
    - 177 mm (one cable guard and 6" motor coupling included).
    - 193 mm (one cable guard and 8" motor coupling included).
- **Maximum pump immersion depth:**
  - 300 m (with L4C motor)
  - 350 m (with L6W and L8W motors).
- **Maximum permissible quantity of suspended sand:** 100 g/m<sup>3</sup>.
- **Delivery port:**
  - Standard version: Rp 2 1/2" for Z612-Z616-Z622 versions.  
Rp 3" for Z631-Z646-Z660 versions.
  - High head version: Rp 3" for Z612-Z616-Z622-Z631 versions.  
Rp 4" for Z646-Z660 versions.
- **Construction materials available:**
  - AISI304 stainless steel (Z6),
  - AISI316 stainless steel (ZN6).
- **All the pumps can operate in the horizontal position (see operating limits in the motors section).**

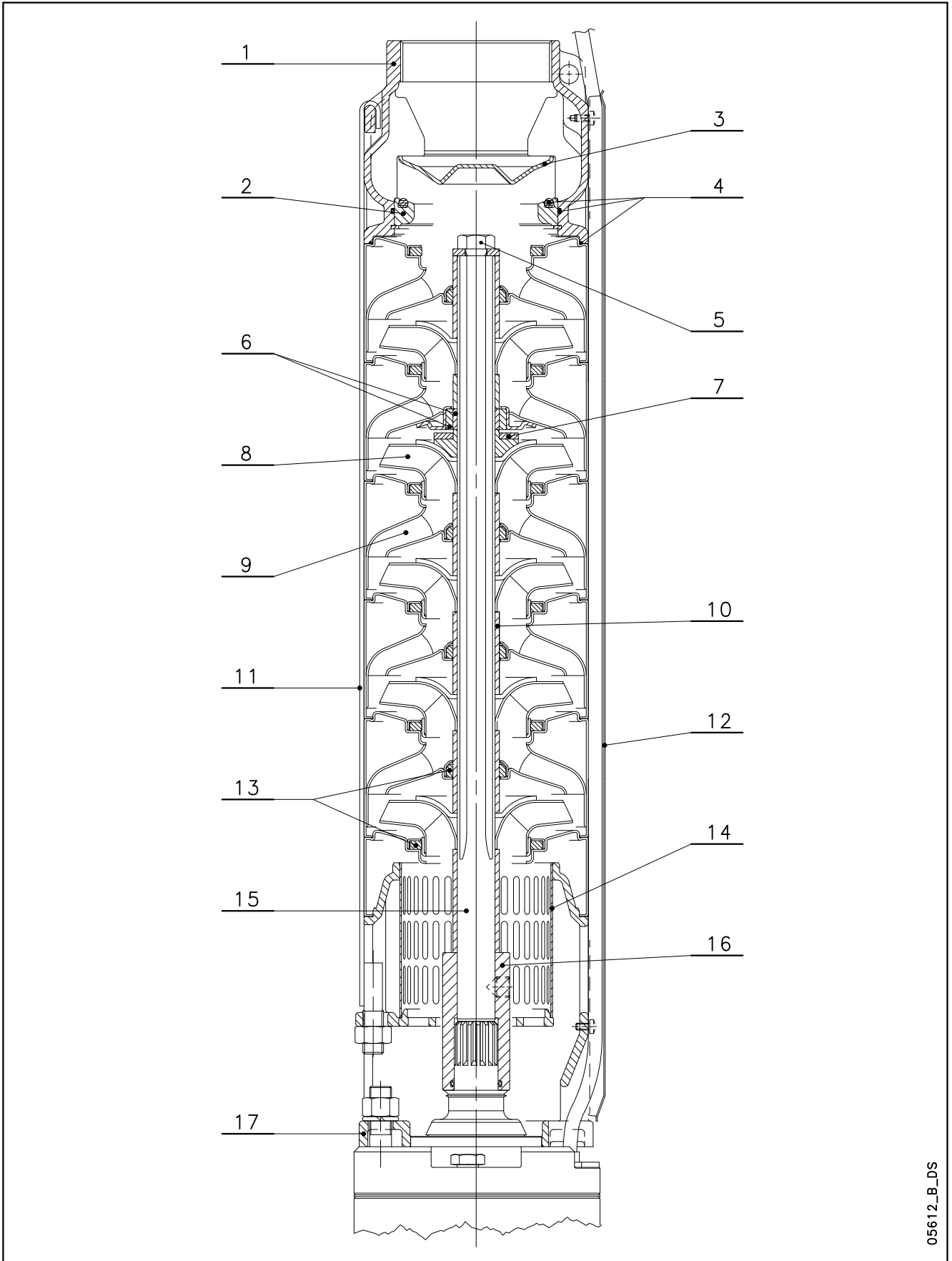
### CONSTRUCTION CHARACTERISTICS

- **Head and motor support** made of microcast stainless steel.
- **Delivery port** equipped with holes for safety hooks .
- Stainless steel **integrated non-return valve**.
- Stainless steel **impeller** with removable wear ring.
- Stainless steel **shaft** protected by shaft sleeves.
- **Replaceable coupling**.

### ACCESSORIES

- Coupling flanges.
- Control panels.
- Drop cables.
- Cable joints
- Cooling shrouds.

**Z6 PUMPS SERIES  
PUMP SECTION AND LIST OF MAIN COMPONENTS**



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## TABLE OF MATERIALS Z6

REF. N°	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Discharge head	Stainless steel	EN 10213-4 - GX5CrNi19-10 (1.4308)	ASTM CF-8 (AISI 304 cast)
2	Valve support	Stainless steel	EN 10213-4 - GX5CrNi19-10 (1.4308)	ASTM CF-8 (AISI 304 cast)
3	Valve	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
4	Elastomers	EPDM		
5	Bolts and screws	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
6	Shaft sleeve and bushing	Tungsten carbide		
7	Thrust bearing	PTFE+Graphite		
8	Impeller	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
9	Diffuser	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
10	Spacer	Stainless steel	EN 10088-1 - X17CrNi16-2 (1.4057)	AISI 431
11	Tie rod	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
12	Cable guard	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
13	Wear rings	Technopolymer PPO		
14	Strainer	Stainless steel	EN 10088-1 - X5CrNi18-10 (1.4301)	AISI 304
15	Shaft	Stainless steel	EN 10088-1 - X17CrNi16-2 (1.4057)	AISI 431
16	Coupling	Stainless steel	EN 10088-1 - X17CrNi16-2 (1.4057)	AISI 431
17	Lower support	Stainless steel	EN 10213-4 - GX5CrNi19-10 (1.4308)	ASTM CF-8 (AISI 304 cast)

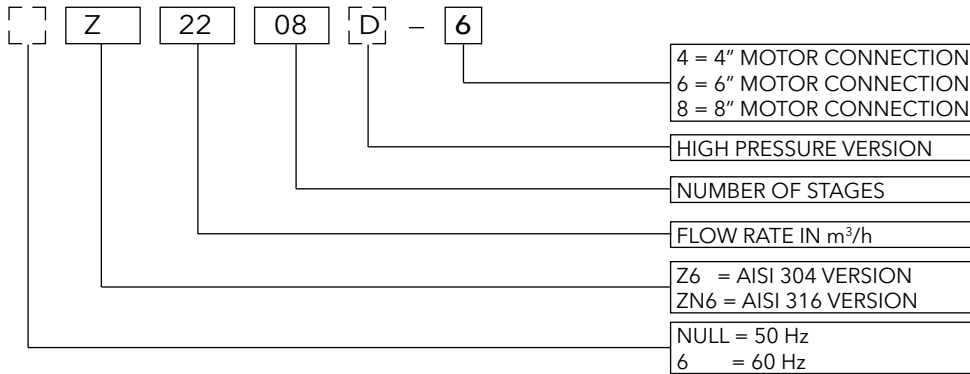
z6-50-304-en\_c\_tm

## TABLE OF MATERIALS ZN6

REF. N°	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Discharge head	Stainless steel	EN 10213-4 - GX5CrNiMo19-11-2 (1.4408)	ASTM CF-8M (AISI 316 cast)
2	Valve support	Stainless steel	EN 10213-4 - GX5CrNiMo19-11-2 (1.4408)	ASTM CF-8M (AISI 316 cast)
3	Valve	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Elastomers	EPDM		
5	Bolts and screws	Stainless steel	EN 10088-1 - X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Shaft sleeve and bushing	Tungsten carbide		
7	Thrust bearing	PTFE+Graphite		
8	Impeller	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
9	Diffuser	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Spacer	Duplex stainless steel	EN 10088-1 - X2CrNiN23-4 (1.4362)	UNS S 32304
11	Tie rod	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
12	Cable guard	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
13	Wear rings	Technopolymer PPO		
14	Strainer	Stainless steel	EN 10088-1 - X2CrNiMo17-12-2 (1.4404)	AISI 316L
15	Shaft	Duplex stainless steel	EN 10088-1 - X2CrNiMoN22-5-3 (1.4462)	UNS S 31803
16	Coupling	Duplex stainless steel	EN 10088-1 - X2CrNiN23-4 (1.4362)	UNS S 32304
17	Lower support	Stainless steel	EN 10213-4 - GX5CrNiMo19-11-2 (1.4408)	ASTM CF-8M (AISI 316 cast)

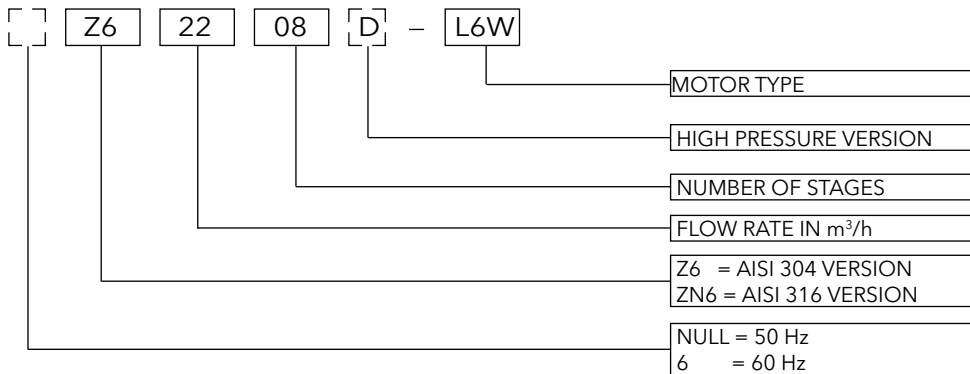
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## Z6 SERIES IDENTIFICATION CODE (PUMP)



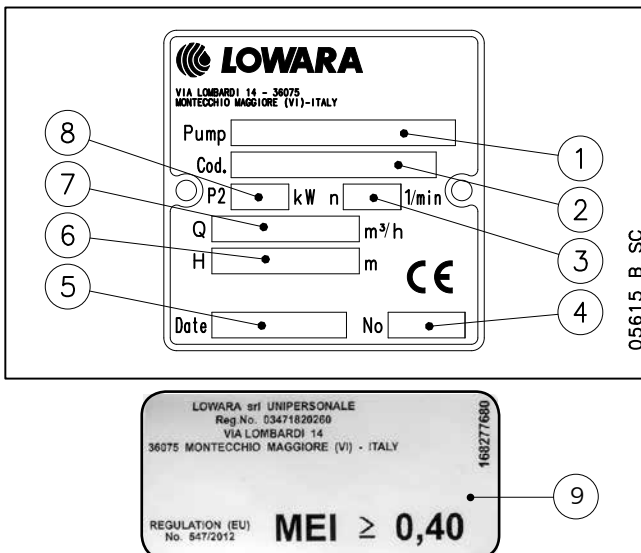
EXAMPLE : Z622 08 - 6  
6" Pump at 50 Hz, AISI 304, flow rate 22 m<sup>3</sup>/h, 8 stages, with 6" motor connection.

## IDENTIFICATION CODE (ELECTRIC PUMP)



EXAMPLE : Z622 08 - L6W  
6" Electric pump at 50 Hz, AISI 304, flow rate 22 m<sup>3</sup>/h, 8 stages, coupled to a 6" motor L6W.

## RATING PLATE



## LEGEND

- 1 - Pump type
- 2 - Code
- 3 - Speed
- 4 - Serial number
- 5 - Date of manufacture
- 6 - Head range
- 7 - Delivery range
- 8 - Rated output
- 9 - MEI label (Regulation (EU) n. 547/2012)



## ErP 2009/125/EC

### Z6 SERIES PUMPS

With the “Energy using Products” (EuP 2005/32/EC) and “Energy related Products” (ErP 2009/125/EC) directives, the European Commission has established requirements for promoting the use of products with low power consumption.

Among the various products considered there are also some typologies of pumps with the characteristics defined by the specific **Regulation (EU) n. 547/2012** implementing the requirements of Directives EuP and ErP.

For vertical multi-stage pumps (MS-V for the Regulations), the efficiency evaluation refers to:

- just the pump and not the pump and motor assembly (electric or combustion);
- pumps with a nominal pressure PN not higher than 25 bar (2500 kPa);
- pumps designed to operate at a speed of 2900 min<sup>-1</sup> (for electric pumps this means 50 Hz 2-pole electric motors);
- pumps with a maximum flow of 100 m<sup>3</sup>/h;
- use with clean water at a temperature ranging from -10°C to 120°C (the test is performed with cold water at a temperature not higher than 40°C).

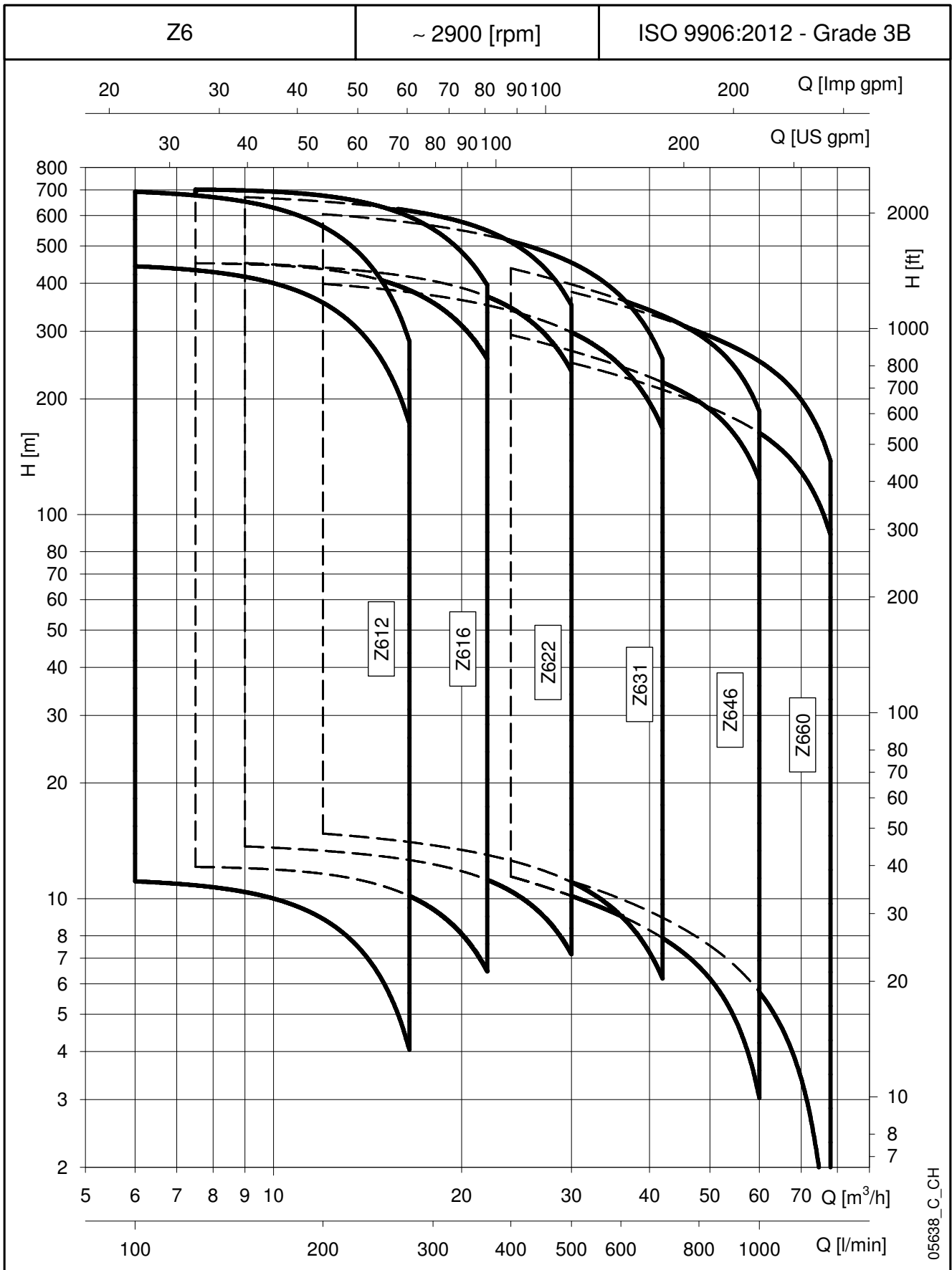
The Regulation also establishes the following deadlines:

from	minimum efficiency index (MEI)
1 <sup>st</sup> January 2015	MEI ≥ 0,4

#### **Regulation (EU) n. 547/2012 - Annex II - point 2 (Product information requirements)**

- 1) Minimum efficiency index: see the MEI column in the tables in the “*Hydraulic performance range*” section.
- 2) “The benchmark for most efficient water pumps is MEI ≥ 0,70”.
- 3) Year of manufacture: from January 2013.
- 4) Manufacturer: Lowara srl Unipersonale - Reg. No. 03471820260 - Montecchio Maggiore, Vicenza, Italy.
- 5) Product type: see the PUMP TYPE column in the tables in the “*Hydraulic performance range*” section.
- 6) Hydraulic pump efficiency with trimmed impeller: not applicable to these products.
- 7) Pump performance curves, including the performance curve: see the “*Operating Characteristics*” graphs in the following pages.
- 8) “The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter”.
- 9) “The operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system”.
- 10) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
- 11) “Designed for use below – 10 °C only”: note not applicable to these products.
- 12) “Designed for use above 120 °C only”: note not applicable to these products.
- 13) Specific instructions for pumps as per points 11 and 12: not applicable to these products.
- 14) “Information on benchmark efficiency is available at”: [www.europump.org](http://www.europump.org) (Ecodesign section).
- 15) The benchmark efficiency graphs with MEI = 0.7 and MEI = 0.4 are available at [www.europump.org/efficiencycharts](http://www.europump.org/efficiencycharts) or <http://europump.net/uploads/Fingerprints.pdf> (refer to “Multistage Vertical 2900 rpm”).

### Z6 SERIES HYDRAULIC PERFORMANCE RANGE



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## Z612 SERIES, 1 TO 19 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			H = TOTAL HEAD METRES COLUMN OF WATER						
			l/min	0	100	150	200	250	275
kw	MEI* ≥	m <sup>3</sup> /h	0	6	9	12	15	16,5	
Z612 01	0,55	0,40	11,5	11,1	10,4	8,9	6,0	4,0	
Z612 02	1,1	0,40	23,1	22,2	20,8	17,7	12,1	8,1	
Z612 03	1,5	0,40	34,7	33,3	31,2	26,5	18,1	12,1	
Z612 04	2,2	0,40	46,3	44,4	41,6	35,3	24,1	16,1	
Z612 05	3	0,40	59,0	57,6	54,6	47,2	33,5	23,7	
Z612 06	3	0,40	70,3	68,3	64,4	55,4	38,9	27,0	
Z612 07	4	0,40	82,5	80,7	76,4	66,1	46,9	33,2	
Z612 08	4	0,40	94,0	91,4	86,2	74,2	52,2	36,5	
Z612 09	5,5	0,40	107,2	105,1	99,7	86,5	61,8	44,1	
Z612 10	5,5	0,40	117,7	115,1	108,9	94,2	66,9	47,3	
Z612 11	5,5	0,40	129,2	125,9	118,9	102,5	72,3	50,7	
Z612 12	7,5	0,40	141,3	138,3	131,0	113,4	80,6	57,1	
Z612 13	7,5	0,40	152,8	149,1	141,0	121,7	86,1	60,5	
Z612 14	7,5	0,40	164,2	159,9	150,8	129,9	91,3	63,8	
Z612 15	7,5	0,40	175,6	170,4	160,5	137,7	96,3	66,8	
Z612 16	9,3	0,40	188,0	183,7	173,7	150,0	106,1	74,7	
Z612 17	9,3	0,40	199,4	194,4	183,5	158,1	111,5	78,0	
Z612 18	9,3	0,40	210,9	205,1	193,3	166,1	116,5	81,0	
Z612 19	9,3	0,40	222,3	215,6	202,8	173,9	121,4	83,9	

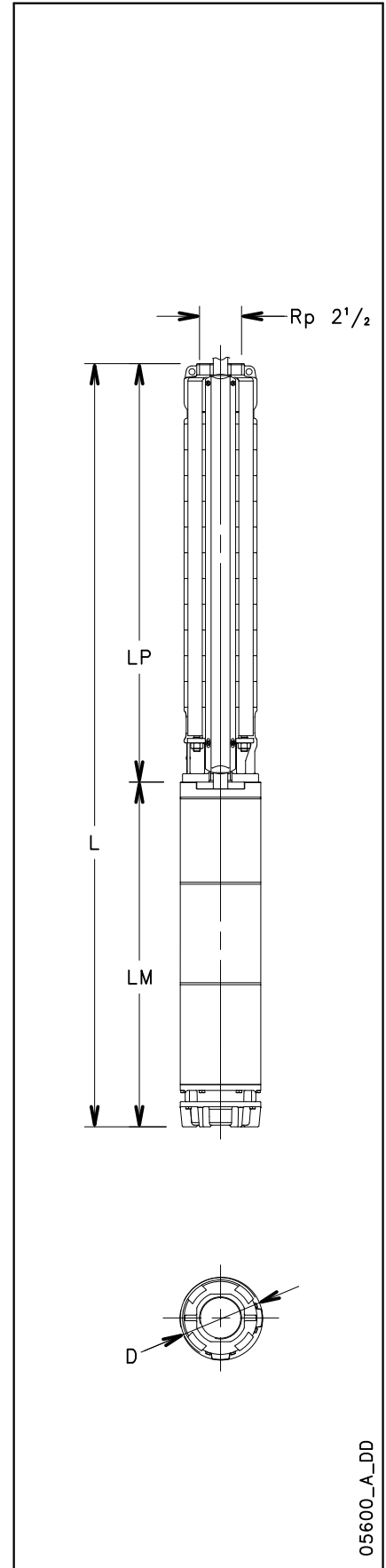
\* Efficiency index MEI

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## ELECTROPUMPS DIMENSIONS AND WEIGHTS

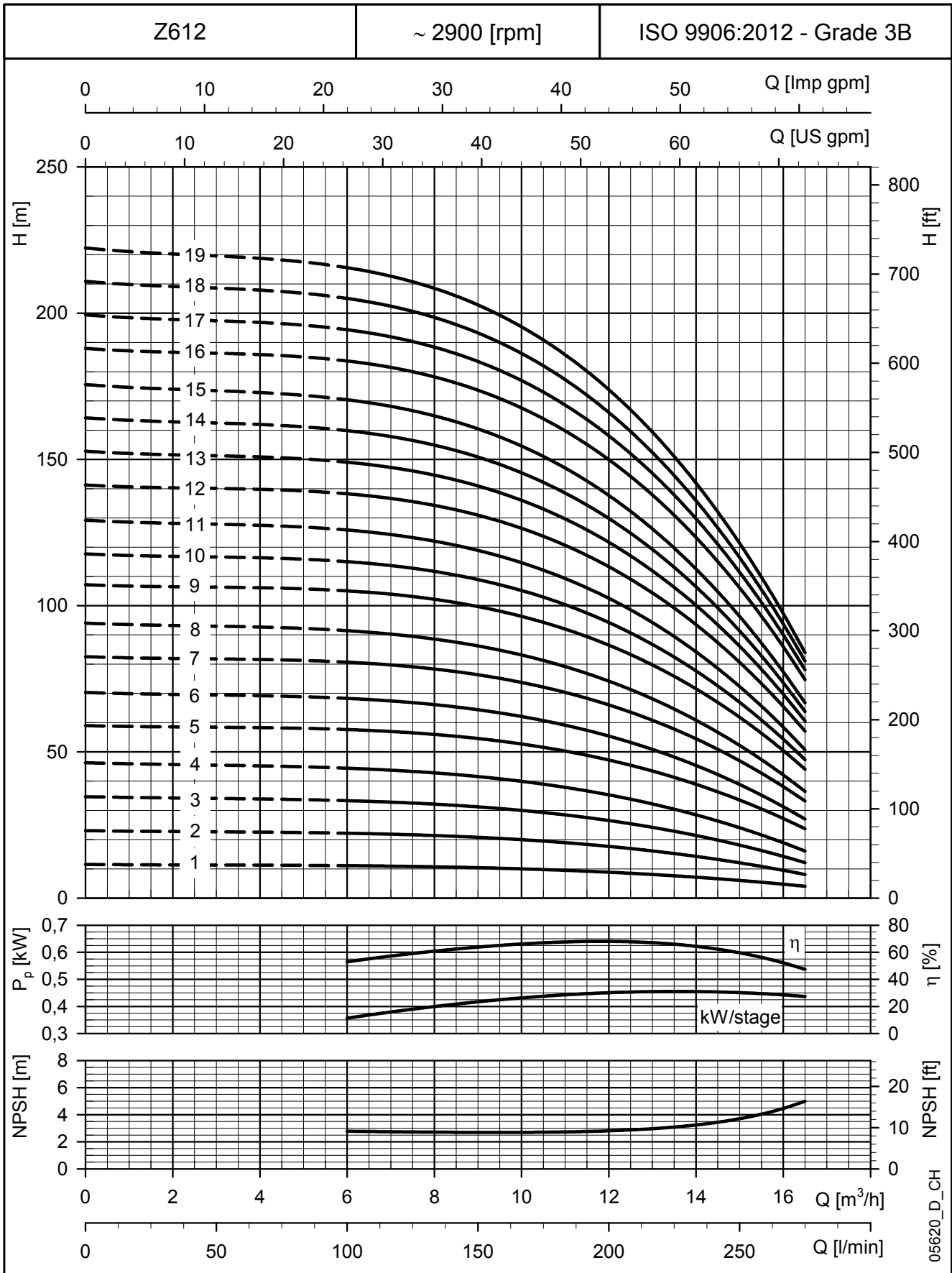
ELECTRO PUMP TYPE	RATED POWER KW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	∅ D		
					1 Cable	2 Cables	
Z612 01-L4C	0,55	616	236	380	142	144	16
Z612 02-L4C	1,1	712	286	426	142	144	19
Z612 03-L4C	1,5	820	348	472	142	144	23
Z612 04-L4C	2,2	911	393	518	142	144	25
Z612 05-L4C	3	1108	544	564	142	144	34
Z612 06-L4C	3	1154	544	610	142	144	36
Z612 07-L4C	4	1270	614	656	142	144	40
Z612 08-L4C	4	1316	614	702	142	144	41
Z612 09-L4C	5,5	1432	684	748	142	144	45
Z612 10-L4C	5,5	1478	684	794	142	144	47
Z612 11-L4C	5,5	1524	684	840	142	144	48
Z612 12-L4C	7,5	1650	764	886	142	144	51
Z612 13-L4C	7,5	1696	764	932	142	144	52
Z612 14-L4C	7,5	1742	764	978	142	144	53
Z612 15-L4C	7,5	1788	764	1024	142	144	55
Z612 07-L6W	4	1239	583	656	144	146	54
Z612 08-L6W	4	1285	583	702	144	146	55
Z612 09-L6W	5,5	1361	613	748	144	146	61
Z612 10-L6W	5,5	1407	613	794	144	146	62
Z612 11-L6W	5,5	1453	613	840	144	146	63
Z612 12-L6W	7,5	1539	653	886	144	146	68
Z612 13-L6W	7,5	1585	653	932	144	146	69
Z612 14-L6W	7,5	1631	653	978	144	146	70
Z612 15-L6W	7,5	1677	653	1024	144	146	72
Z612 16-L6W	9,3	1753	683	1070	144	146	77
Z612 17-L6W	9,3	1799	683	1116	144	146	78
Z612 18-L6W	9,3	1845	683	1162	144	146	79
Z612 19-L6W	9,3	1891	683	1208	144	146	80

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### Z612 SERIES, 1 TO 19 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



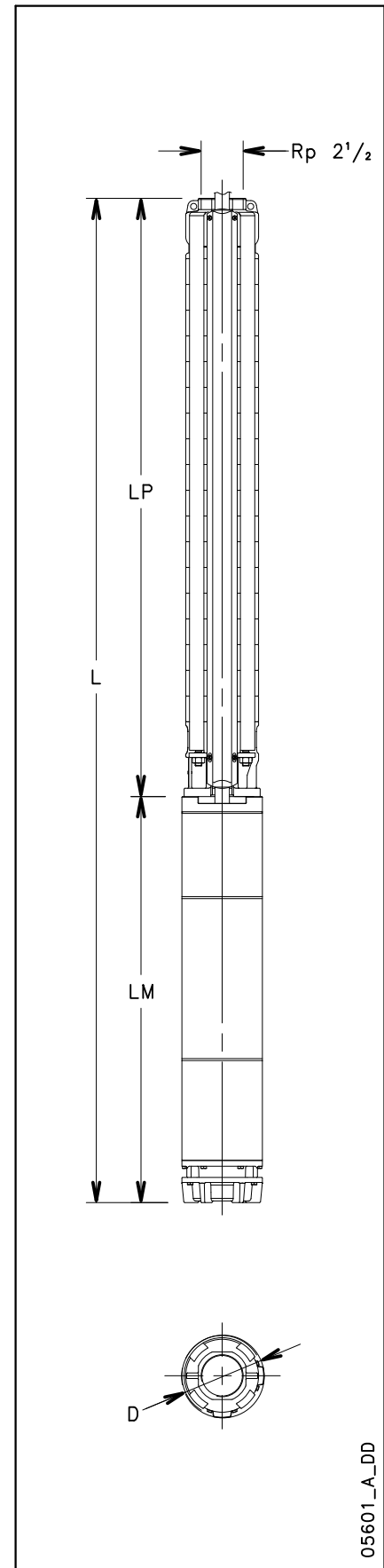
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z612 SERIES, 20 TO 39 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	100	150	200	250	275
			m <sup>3</sup> /h	0	6	9	12	15	16,5
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z612 20	11	0,40	237,2	228,9	216,4	187,5	133,7	95,0	
Z612 21	11	0,40	248,7	239,5	226,2	195,5	139,0	98,4	
Z612 22	11	0,40	260,2	250,1	235,8	203,5	144,1	101,4	
Z612 23	11	0,40	271,7	260,5	245,4	211,4	149,2	104,5	
Z612 24	13	0,40	283,8	274,4	258,8	222,5	155,3	107,0	
Z612 25	13	0,40	295,2	285,0	268,5	230,5	160,3	109,9	
Z612 26	13	0,40	306,6	295,5	278,1	238,3	165,2	112,7	
Z612 27	13	0,40	318,0	306,0	287,6	246,0	169,8	115,3	
Z612 28	13	0,40	329,5	316,4	297,1	253,6	174,5	117,9	
Z612 29	15	0,40	344,4	334,0	315,1	272,2	194,1	138,3	
Z612 30	15	0,40	356,0	344,7	324,9	280,3	199,3	141,6	
Z612 31	15	0,40	367,3	355,3	334,6	288,2	204,3	144,7	
Z612 32	15	0,40	378,9	365,8	344,1	296,0	209,2	147,5	
Z612 33	18,5	0,40	389,0	379,1	357,5	308,1	218,2	154,2	
Z612 34	18,5	0,40	400,6	389,9	367,4	316,3	223,6	157,6	
Z612 35	18,5	0,40	412,1	400,5	377,1	324,3	228,6	160,6	
Z612 36	18,5	0,40	423,3	411,2	386,9	332,2	233,7	163,7	
Z612 37	18,5	0,40	434,7	421,7	396,4	340,0	238,7	166,8	
Z612 38	18,5	0,40	446,2	432,3	406,3	348,2	243,8	169,8	
Z612 39	18,5	0,40	457,6	442,8	415,7	355,9	248,7	172,7	

\* Efficiency index MEI

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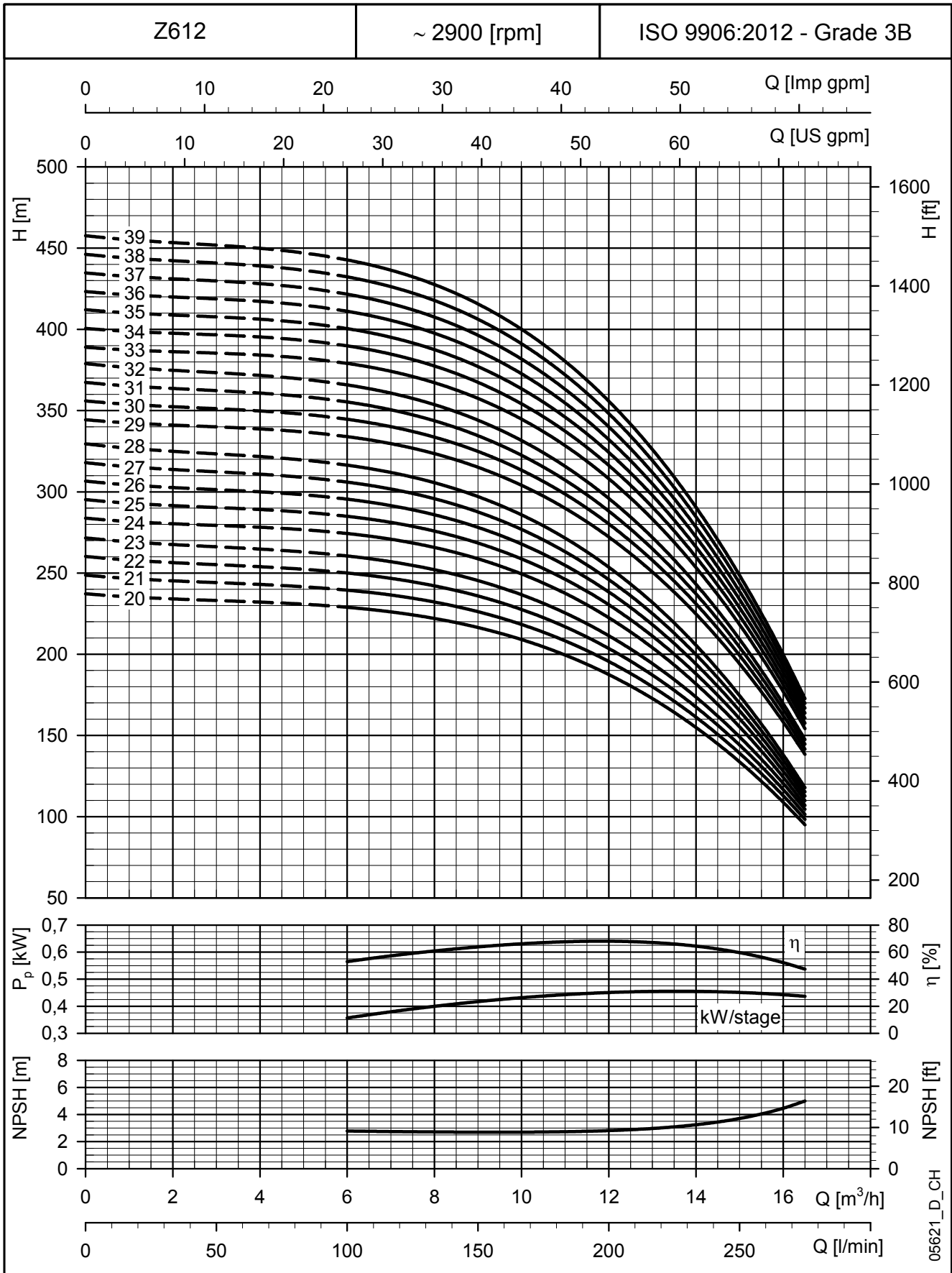
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## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	$\varnothing$ D		
					1 Cable	2 Cables	
Z612 20-L6W	11	1977	723	1254	144	146	86
Z612 21-L6W	11	2023	723	1300	144	146	87
Z612 22-L6W	11	2069	723	1346	144	146	88
Z612 23-L6W	11	2161	723	1438	144	146	90
Z612 24-L6W	13	2247	763	1484	144	146	95
Z612 25-L6W	13	2293	763	1530	144	146	96
Z612 26-L6W	13	2339	763	1576	144	146	98
Z612 27-L6W	13	2385	763	1622	144	146	99
Z612 28-L6W	13	2431	763	1668	144	146	100
Z612 29-L6W	15	2547	833	1714	144	146	109
Z612 30-L6W	15	2593	833	1760	144	146	110
Z612 31-L6W	15	2639	833	1806	144	146	112
Z612 32-L6W	15	2685	833	1852	144	146	113
Z612 33-L6W	18,5	2801	903	1898	144	146	122
Z612 34-L6W	18,5	2847	903	1944	144	146	123
Z612 35-L6W	18,5	2893	903	1990	144	146	124
Z612 36-L6W	18,5	2985	903	2082	144	146	126
Z612 37-L6W	18,5	3031	903	2128	144	146	128
Z612 38-L6W	18,5	3077	903	2174	144	146	129
Z612 39-L6W	18,5	3123	903	2220	144	146	130

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### Z612 SERIES, 20 TO 39 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



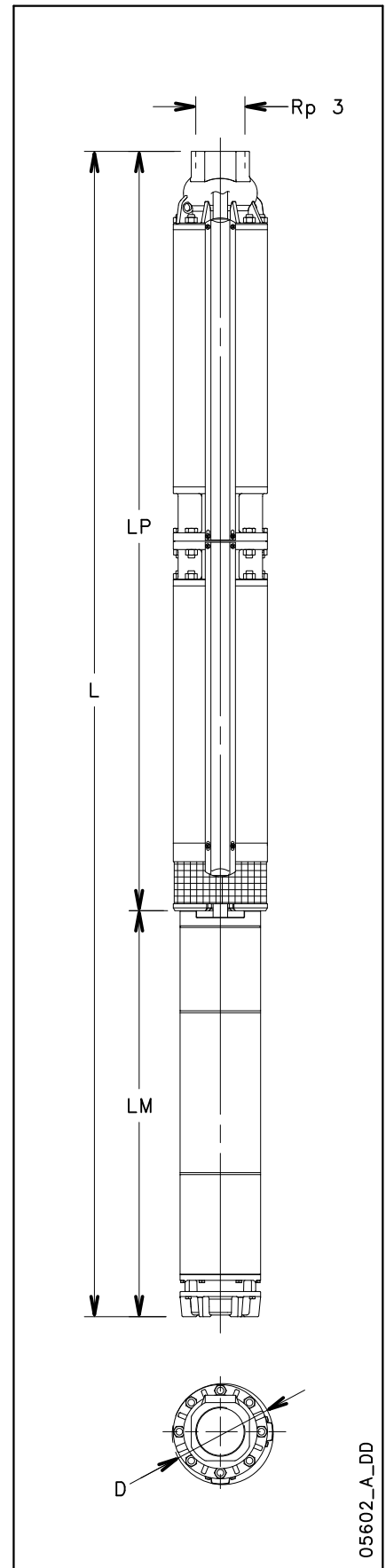
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z612 SERIES, 40 TO 60 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	100	150	200	250	275
			m <sup>3</sup> /h	0	6	9	12	15	16,5
	kW	MEI* ≥	H = TOTAL HEAD METRES COLUMN OF WATER						
Z612 40D	18,5	0,40	468,7	453,3	425,2	363,5	253,4	175,5	
Z612 41D	22	0,40	484,7	471,8	444,8	383,3	271,8	192,4	
Z612 42D	22	0,40	496,1	482,6	454,6	391,4	276,9	195,4	
Z612 43D	22	0,40	507,6	493,2	464,3	399,2	281,9	198,5	
Z612 44D	22	0,40	519,1	503,8	474,0	407,3	287,0	201,6	
Z612 45D	22	0,40	530,5	514,4	483,7	415,3	292,2	204,9	
Z612 46D	22	0,40	541,9	525,0	493,1	422,8	296,8	207,6	
Z612 47D	22	0,40	553,3	535,5	502,8	430,7	301,7	210,5	
Z612 48D	26	0,40	569,6	557,2	526,8	455,9	326,1	233,4	
Z612 49D	26	0,40	581,1	568,1	536,9	464,4	331,8	237,1	
Z612 50D	26	0,40	592,7	578,9	546,8	472,6	337,2	240,7	
Z612 51D	26	0,40	604,1	589,8	556,8	480,9	342,6	244,1	
Z612 52D	26	0,40	615,9	600,8	566,8	489,1	348,0	247,6	
Z612 53D	26	0,40	627,4	611,6	576,8	497,5	353,6	251,1	
Z612 54D	26	0,40	638,8	622,4	586,6	505,4	358,6	254,3	
Z612 55D	26	0,40	650,2	633,0	596,4	513,6	364,0	257,7	
Z612 56D	30	0,40	664,2	648,5	612,4	529,1	377,4	269,3	
Z612 57D	30	0,40	675,7	659,3	622,2	537,2	382,7	272,7	
Z612 58D	30	0,40	687,5	670,2	632,3	545,5	388,2	276,1	
Z612 59D	30	0,40	698,9	680,9	642,2	553,8	393,6	279,5	
Z612 60D	30	0,40	710,2	691,9	652,1	561,9	398,6	282,6	

\* Efficiency index MEI

z612-3-50-en\_c\_th



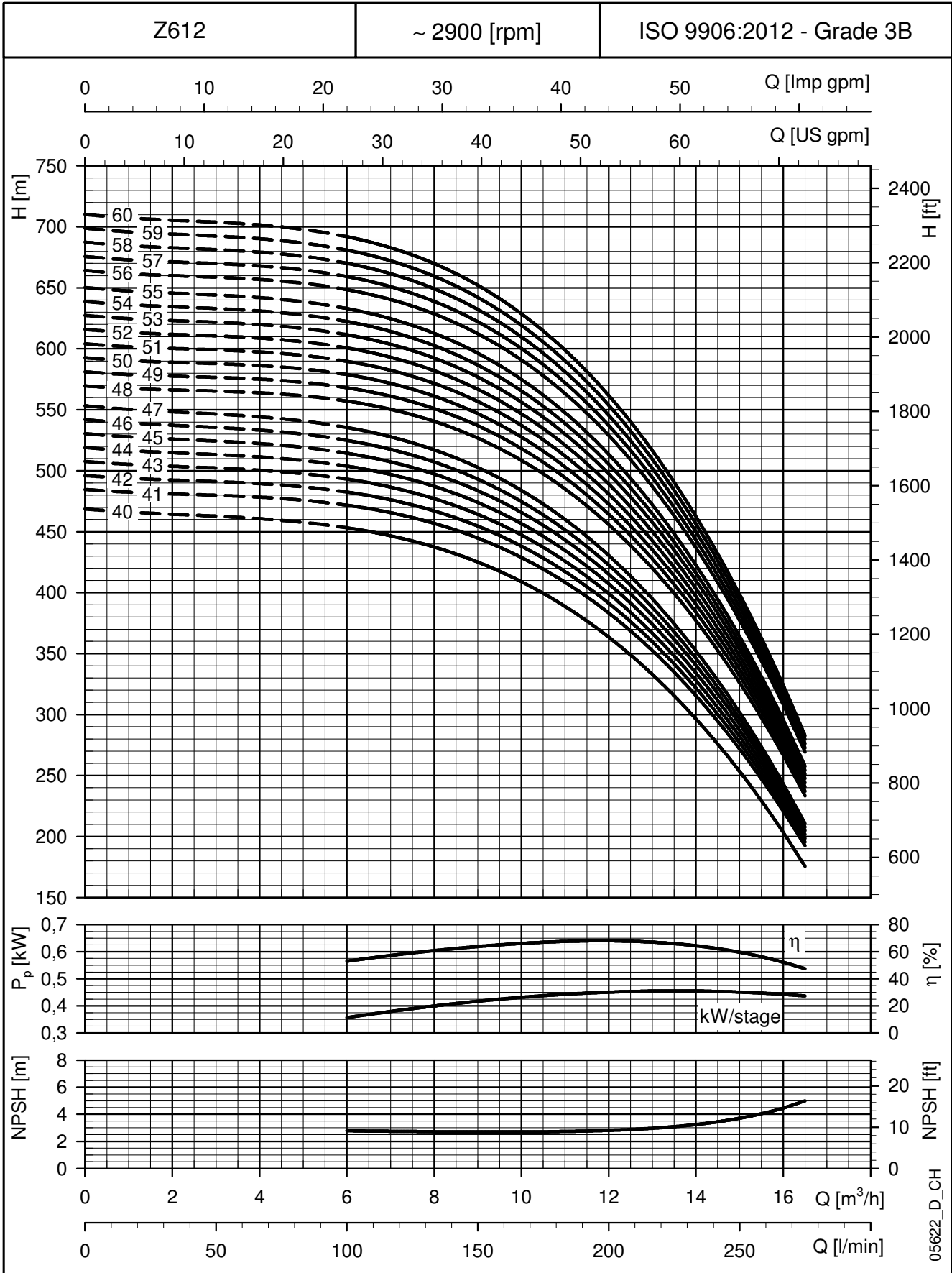
05602\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z612 40D-L6W	18,5	3825	903	2922	177	180	188
Z612 41D-L6W	22	3865	943	2922	177	180	192
Z612 42D-L6W	22	3865	943	2922	177	180	193
Z612 43D-L6W	22	3865	943	2922	177	180	193
Z612 44D-L6W	22	3865	943	2922	177	180	194
Z612 45D-L6W	22	3865	943	2922	177	180	194
Z612 46D-L6W	22	3865	943	2922	177	180	195
Z612 47D-L6W	22	3865	943	2922	177	180	195
Z612 48D-L6W	26	4407	1071	3336	177	180	217
Z612 49D-L6W	26	4407	1071	3336	177	180	218
Z612 50D-L6W	26	4407	1071	3336	177	180	218
Z612 51D-L6W	26	4407	1071	3336	177	180	219
Z612 52D-L6W	26	4407	1071	3336	177	180	219
Z612 53D-L6W	26	4407	1071	3336	177	180	220
Z612 54D-L6W	26	4407	1071	3336	177	180	221
Z612 55D-L6W	26	4407	1071	3336	177	180	221
Z612 56D-L6W	30	4487	1151	3336	177	180	230
Z612 57D-L6W	30	4625	1151	3474	177	180	234
Z612 58D-L6W	30	4625	1151	3474	177	180	234
Z612 59D-L6W	30	4625	1151	3474	177	180	235
Z612 60D-L6W	30	4763	1151	3612	177	180	239

z612-3-50-en\_b\_td

**Z612 SERIES, 40 TO 60 STAGES**  
**ELECTROPUMPS OPERATING CHARACTERISTICS**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



## Z616 SERIES, 1 TO 18 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	125	200	250	300	367
			m <sup>3</sup> /h	0	7,5	12	15	18	22
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z616 01	0,75	0,40	12,3	12,1	11,6	10,8	9,4	6,5	
Z616 02	1,5	0,40	24,7	24,1	23,1	21,4	18,6	12,7	
Z616 03	2,2	0,40	36,9	35,8	34,1	31,5	27,2	18,2	
Z616 04	3	0,40	49,9	49,5	47,8	44,6	39,3	28,2	
Z616 05	4	0,40	62,7	62,4	60,3	56,4	49,8	36,0	
Z616 06	5,5	0,40	75,7	75,5	73,3	68,7	60,8	44,3	
Z616 07	5,5	0,40	88,1	87,8	84,9	79,3	69,9	50,7	
Z616 08	7,5	0,40	100,7	100,6	97,5	91,2	80,6	58,6	
Z616 09	7,5	0,40	113,3	112,8	109,0	101,8	89,6	64,9	
Z616 10	7,5	0,40	126,0	124,7	120,0	111,6	97,6	68,7	
Z616 11	9,3	0,40	139,0	138,1	133,3	124,3	109,1	77,7	
Z616 12	9,3	0,40	151,7	150,1	144,9	135,2	118,8	85,0	
Z616 13	11	0,40	164,5	163,0	157,6	147,3	129,8	93,2	
Z616 14	11	0,40	176,6	175,1	168,9	157,8	139,0	100,3	
Z616 15	11	0,40	188,8	186,8	179,9	167,8	147,5	105,5	
Z616 16	11	0,40	201,1	198,5	190,8	177,6	155,7	110,9	
Z616 17	13	0,40	214,7	211,9	203,5	188,8	164,9	118,0	
Z616 18	13	0,40	227,0	223,6	214,3	198,5	173,0	123,5	

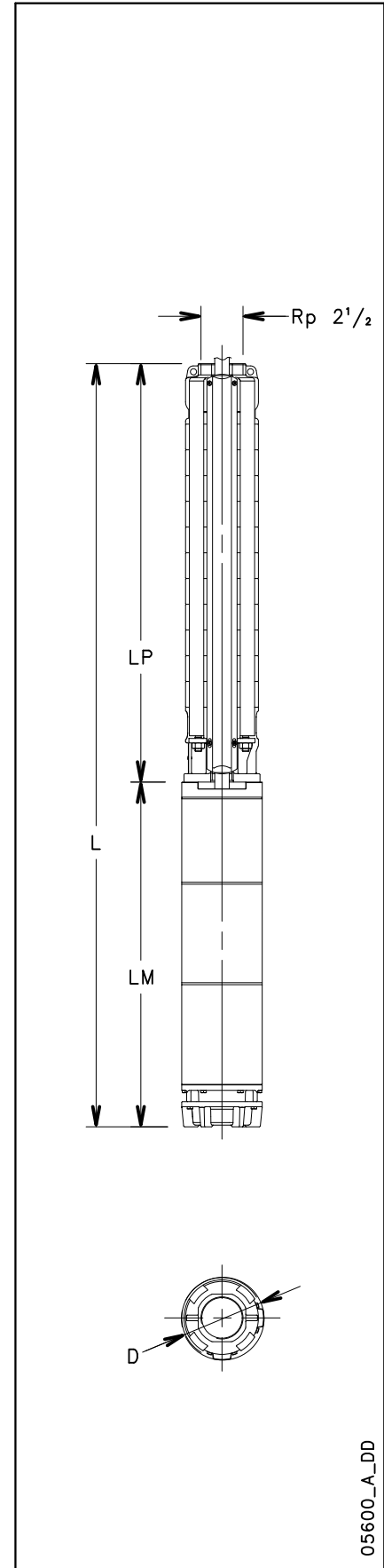
\* Efficiency index MEI

z616-1-50-en\_b\_th

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

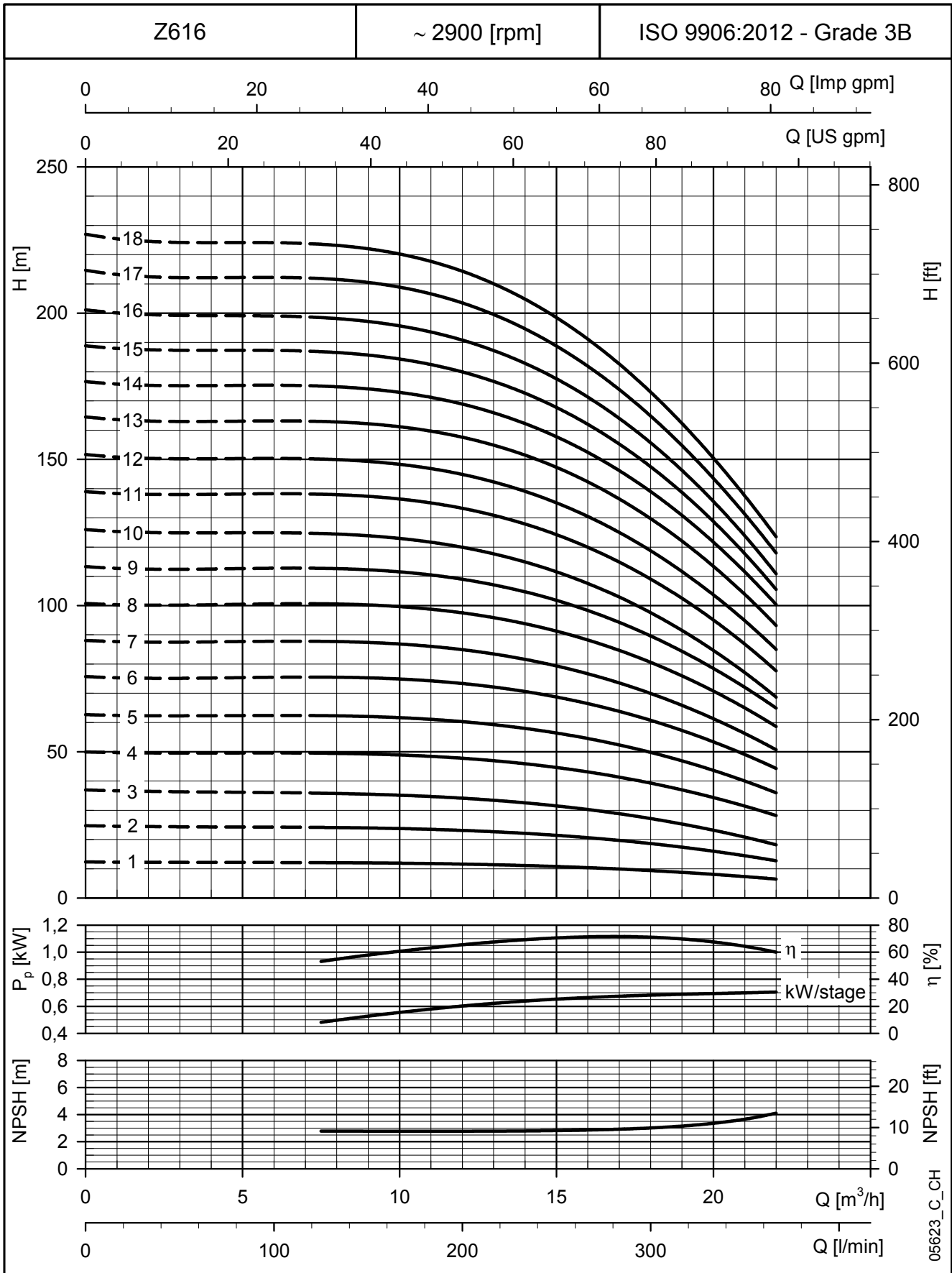
ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z616 01-L4C	0,75	646	266	380	142	144	17
Z616 02-L4C	1,5	774	348	426	142	144	22
Z616 03-L4C	2,2	865	393	472	142	144	24
Z616 04-L4C	3	1062	544	518	142	144	33
Z616 05-L4C	4	1178	614	564	142	144	37
Z616 06-L4C	5,5	1294	684	610	142	144	42
Z616 07-L4C	5,5	1340	684	656	142	144	43
Z616 08-L4C	7,5	1466	764	702	142	144	46
Z616 09-L4C	7,5	1512	764	748	142	144	48
Z616 10-L4C	7,5	1558	764	794	142	144	49
Z616 05-L6W	4	1147	583	564	144	146	52
Z616 06-L6W	5,5	1223	613	610	144	146	57
Z616 07-L6W	5,5	1269	613	656	144	146	58
Z616 08-L6W	7,5	1355	653	702	144	146	63
Z616 09-L6W	7,5	1401	653	748	144	146	65
Z616 10-L6W	7,5	1447	653	794	144	146	66
Z616 11-L6W	9,3	1523	683	840	144	146	71
Z616 12-L6W	9,3	1569	683	886	144	146	72
Z616 13-L6W	11	1655	723	932	144	146	77
Z616 14-L6W	11	1701	723	978	144	146	78
Z616 15-L6W	11	1747	723	1024	144	146	80
Z616 16-L6W	11	1793	723	1070	144	146	81
Z616 17-L6W	13	1879	763	1116	144	146	86
Z616 18-L6W	13	1925	763	1162	144	146	87

z616-1-50-en\_a\_td



05600\_A\_DD

### Z616 SERIES, 1 TO 18 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z616 SERIES, 19 TO 36 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

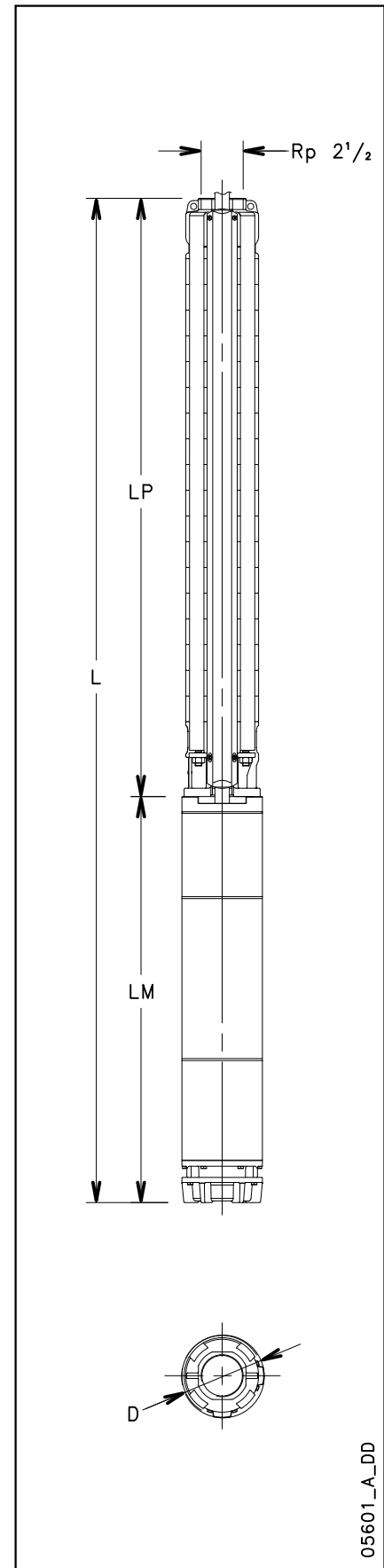
PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	125	200	250	300	367
			m <sup>3</sup> /h	0	7,5	12	15	18	22
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z616 19	15	0,40	240,1	237,5	228,4	212,2	185,6	133,4	
Z616 20	15	0,40	250,7	248,1	238,6	221,8	194,1	137,1	
Z616 21	15	0,40	262,9	259,7	249,4	231,7	202,3	142,1	
Z616 22	18,5	0,40	276,4	274,6	264,9	247,0	216,9	154,4	
Z616 23	18,5	0,40	288,5	286,4	276,0	257,1	225,5	160,1	
Z616 24	18,5	0,40	300,9	298,2	287,0	267,1	233,9	165,5	
Z616 25	18,5	0,40	313,0	310,0	298,0	277,0	242,2	171,2	
Z616 26	18,5	0,40	325,3	321,5	308,8	286,8	250,5	176,0	
Z616 27	22	0,40	340,3	337,9	325,8	303,9	267,0	190,3	
Z616 28	22	0,40	352,7	349,7	337,0	314,0	275,5	195,8	
Z616 29	22	0,40	364,8	361,6	348,1	324,1	284,1	201,6	
Z616 30	22	0,40	377,1	373,2	358,9	333,9	292,4	206,7	
Z616 31	26	0,40	391,8	391,0	378,3	353,9	312,1	225,1	
Z616 32	26	0,40	404,2	403,0	389,7	364,3	321,0	230,9	
Z616 33	26	0,40	416,8	415,1	401,1	374,8	330,0	237,0	
Z616 34	26	0,40	429,1	427,1	412,5	385,0	338,6	242,9	
Z616 35	26	0,40	441,4	439,0	423,7	395,3	347,5	248,6	
Z616 36	26	0,40	453,8	450,9	434,9	405,5	356,1	254,0	

\* Efficiency index MEI

z616-2-50-en\_b\_th

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

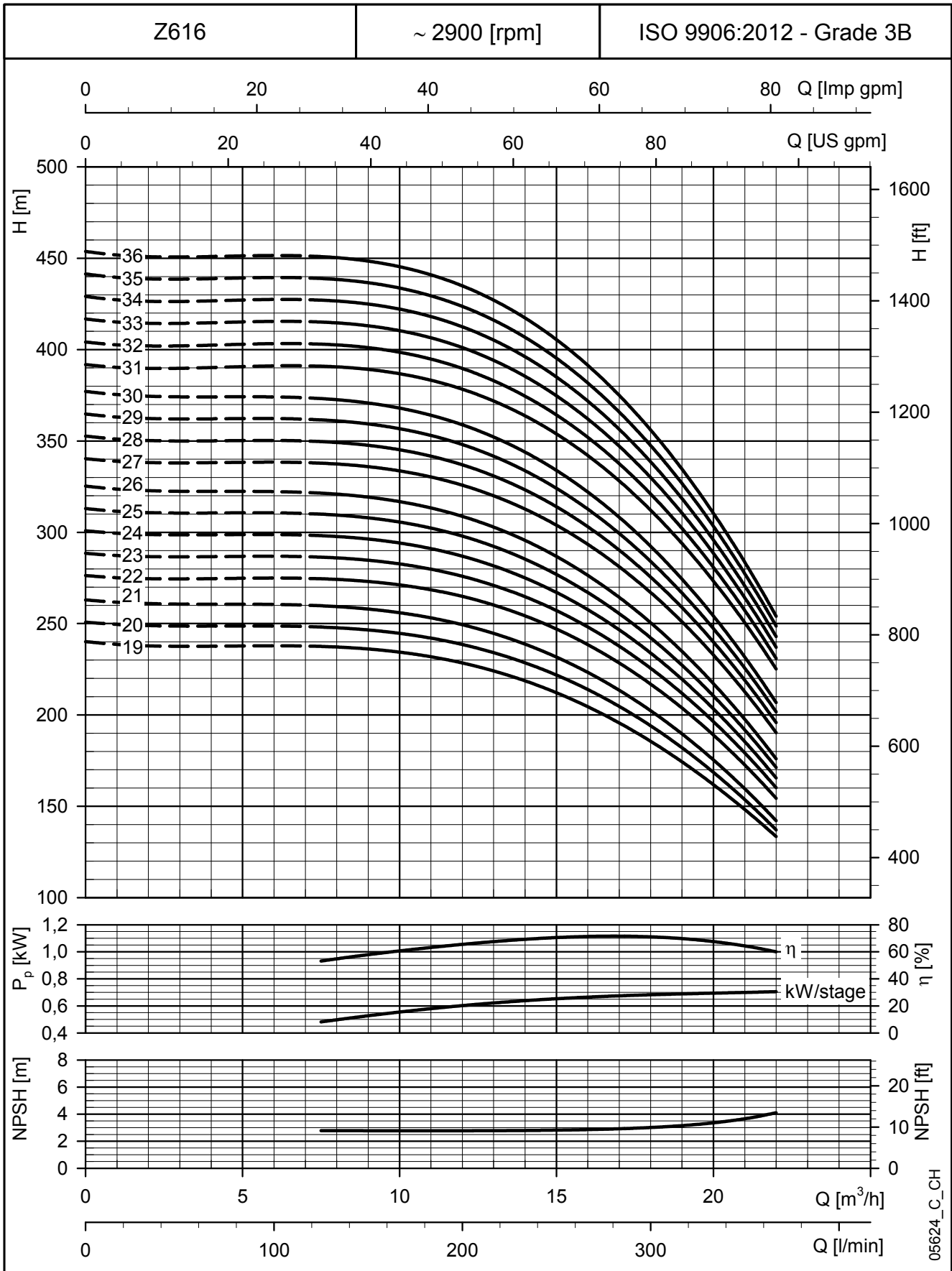
ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z616 19-L6W	15	2041	833	1208	144	146	96
Z616 20-L6W	15	2087	833	1254	144	146	98
Z616 21-L6W	15	2133	833	1300	144	146	99
Z616 22-L6W	18,5	2249	903	1346	144	146	108
Z616 23-L6W	18,5	2341	903	1438	144	146	110
Z616 24-L6W	18,5	2387	903	1484	144	146	111
Z616 25-L6W	18,5	2433	903	1530	144	146	112
Z616 26-L6W	18,5	2479	903	1576	144	146	114
Z616 27-L6W	22	2565	943	1622	144	146	118
Z616 28-L6W	22	2611	943	1668	144	146	119
Z616 29-L6W	22	2657	943	1714	144	146	120
Z616 30-L6W	22	2703	943	1760	144	146	121
Z616 31-L6W	26	2877	1071	1806	144	146	132
Z616 32-L6W	26	2923	1071	1852	144	146	133
Z616 33-L6W	26	2969	1071	1898	144	146	134
Z616 34-L6W	26	3015	1071	1944	144	146	135
Z616 35-L6W	26	3061	1071	1990	144	146	136
Z616 36-L6W	26	3153	1071	2082	144	146	138



05601\_A\_DD

z616-2-50-en\_a\_td

### Z616 SERIES, 19 TO 36 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



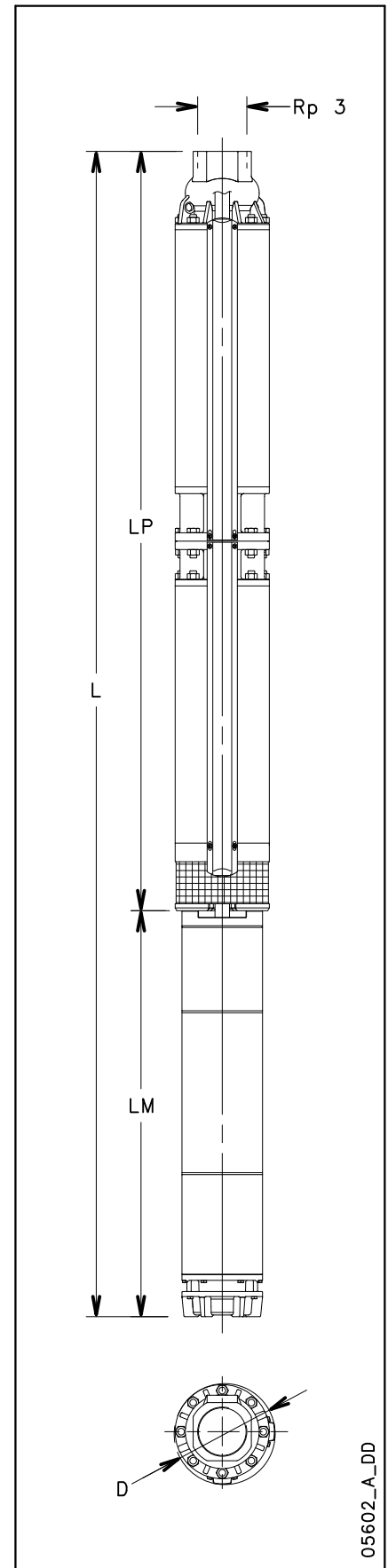
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z616 SERIES, 37 TO 56 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY					
			l/min	125	200	250	300	367
			0	7,5	12	15	18	22
	kW	MEI* ≥	H = TOTAL HEAD METRES COLUMN OF WATER					
Z616 37D	30	0,40	467,3	465,4	449,6	420,0	369,7	265,2
Z616 38D	30	0,40	479,6	477,4	460,9	430,2	378,5	271,1
Z616 39D	30	0,40	492,2	489,4	472,1	440,3	387,0	277,3
Z616 40D	30	0,40	504,5	501,2	483,2	450,5	395,6	282,2
Z616 41D	30	0,40	516,8	513,1	494,3	460,6	404,2	287,9
Z616 42D	30	0,40	529,1	524,8	505,4	470,7	412,8	293,2
Z616 43D	37	0,40	543,1	541,4	523,4	488,9	430,6	310,5
Z616 44D	37	0,40	555,4	553,6	534,7	499,3	439,4	315,6
Z616 45D	37	0,40	568,0	565,3	545,9	509,6	448,3	321,1
Z616 46D	37	0,40	580,2	577,4	557,2	519,9	456,9	326,3
Z616 47D	37	0,40	592,4	589,3	568,3	529,8	465,3	332,1
Z616 48D	37	0,40	605,0	601,1	579,5	540,1	473,9	337,3
Z616 49D	37	0,40	617,2	613,1	590,6	550,0	482,2	342,9
Z616 50D	37	0,40	629,4	624,8	601,4	559,8	490,4	348,3
Z616 51D	37	0,40	641,9	636,6	612,6	569,8	498,8	353,4
Z616 52D	37	0,40	654,2	648,3	623,2	579,5	507,0	358,3
Z616 53D	45	0,40	669,3	665,5	642,3	599,5	527,3	377,7
Z616 54D	45	0,40	681,6	677,3	653,4	609,8	536,3	382,9
Z616 55D	45	0,40	693,9	689,4	664,6	620,0	544,9	389,3
Z616 56D	45	0,40	706,4	701,3	676,0	630,1	553,4	395,6

\* Efficiency index MEI

z616-3-50-en\_b\_th



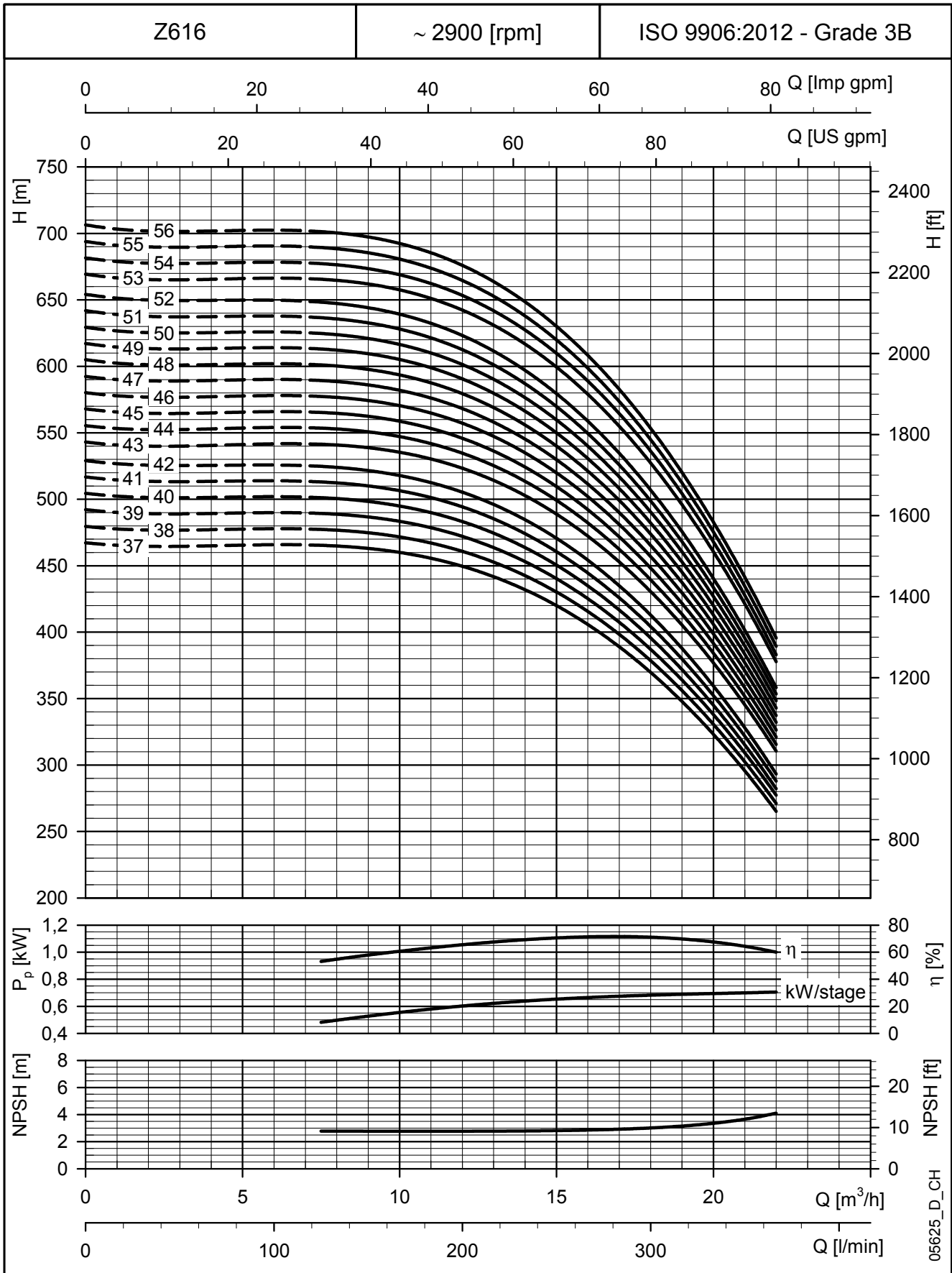
05602\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z616 37D-L6W	30	3659	1151	2508	177	180	197
Z616 38D-L6W	30	3659	1151	2508	177	180	197
Z616 39D-L6W	30	4073	1151	2922	177	180	208
Z616 40D-L6W	30	4073	1151	2922	177	180	208
Z616 41D-L6W	30	4073	1151	2922	177	180	209
Z616 42D-L6W	30	4073	1151	2922	177	180	210
Z616 43D-L6W	37	4223	1301	2922	177	180	224
Z616 44D-L6W	37	4223	1301	2922	177	180	225
Z616 45D-L6W	37	4223	1301	2922	177	180	225
Z616 46D-L6W	37	4223	1301	2922	177	180	226
Z616 47D-L6W	37	4223	1301	2922	177	180	226
Z616 48D-L6W	37	4637	1301	3336	177	180	239
Z616 49D-L6W	37	4637	1301	3336	177	180	240
Z616 50D-L6W	37	4637	1301	3336	177	180	240
Z616 51D-L6W	37	4637	1301	3336	177	180	241
Z616 52D-L6W	37	4637	1301	3336	177	180	241
Z616 53D-L8W	45	4520	1135	3385	193	195	316
Z616 54D-L8W	45	4520	1135	3385	193	195	317
Z616 55D-L8W	45	4520	1135	3385	193	195	318
Z616 56D-L8W	45	4520	1135	3385	193	195	318

z616-3-50-en\_b\_td

### Z616 SERIES, 37 TO 56 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



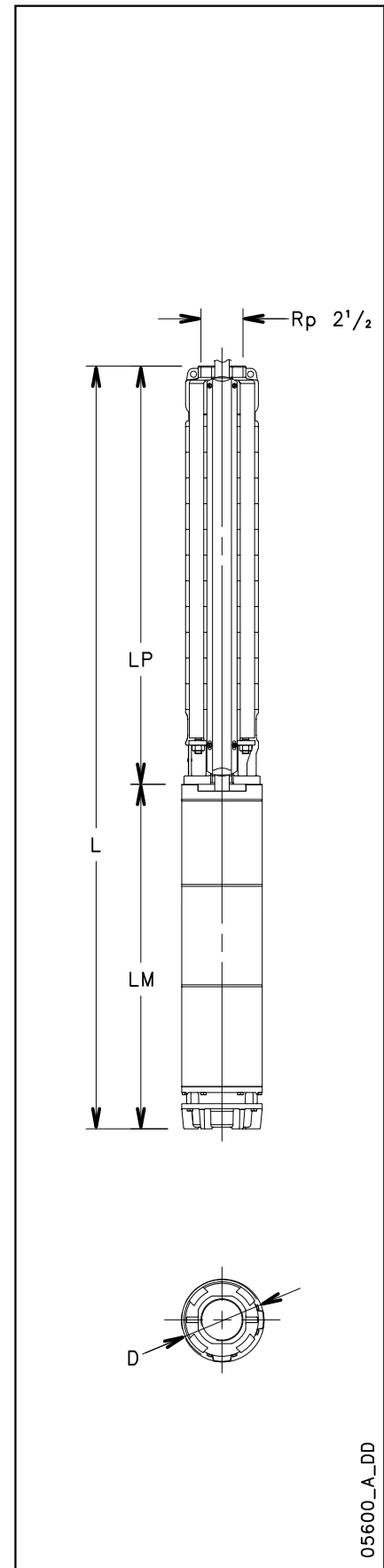
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z622 SERIES, 1 TO 17 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

POMPA TIPO	POTENZA NOMINALE kW   MEI* ≥		Q = PORTATA						
			l/min	0	150	200	300	400	500
			m <sup>3</sup> /h	0	9	12	18	24	30
H = PREVALENZA TOTALE IN METRI COLONNA ACQUA									
Z622 01	1,1	0,40	13,8	12,8	12,4	11,2	9,2	5,9	
Z622 02	2,2	0,40	27,7	25,5	24,8	22,5	18,4	11,7	
Z622 03	3	0,40	42,8	40,3	39,3	36,3	30,5	20,6	
Z622 04	4	0,40	57,6	54,2	53,0	48,8	41,0	27,8	
Z622 05	5,5	0,40	72,4	68,3	66,8	61,8	52,2	35,9	
Z622 06	7,5	0,40	86,5	82,0	80,2	74,2	62,6	42,9	
Z622 07	7,5	0,40	100,1	94,7	92,6	85,3	71,6	48,3	
Z622 08	9,3	0,40	111,6	107,5	105,1	96,7	80,9	54,8	
Z622 09	9,3	0,40	124,8	120,0	117,2	107,4	89,4	60,0	
Z622 10	11	0,40	143,6	135,5	132,4	122,2	102,6	69,0	
Z622 11	11	0,40	157,0	148,0	144,6	133,0	111,2	74,0	
Z622 12	13	0,40	172,1	162,4	158,6	146,3	122,7	82,3	
Z622 13	13	0,40	184,3	173,6	169,4	155,6	129,6	85,5	
Z622 14	15	0,40	201,0	190,1	185,8	171,7	144,6	97,9	
Z622 15	15	0,40	214,4	202,7	198,1	182,7	153,3	103,1	
Z622 16	18,5	0,40	225,9	213,9	209,3	193,5	162,7	109,6	
Z622 17	18,5	0,40	239,3	226,5	221,4	204,3	171,4	114,8	

\* Indice efficienze MEI

z622-1-50\_b\_th

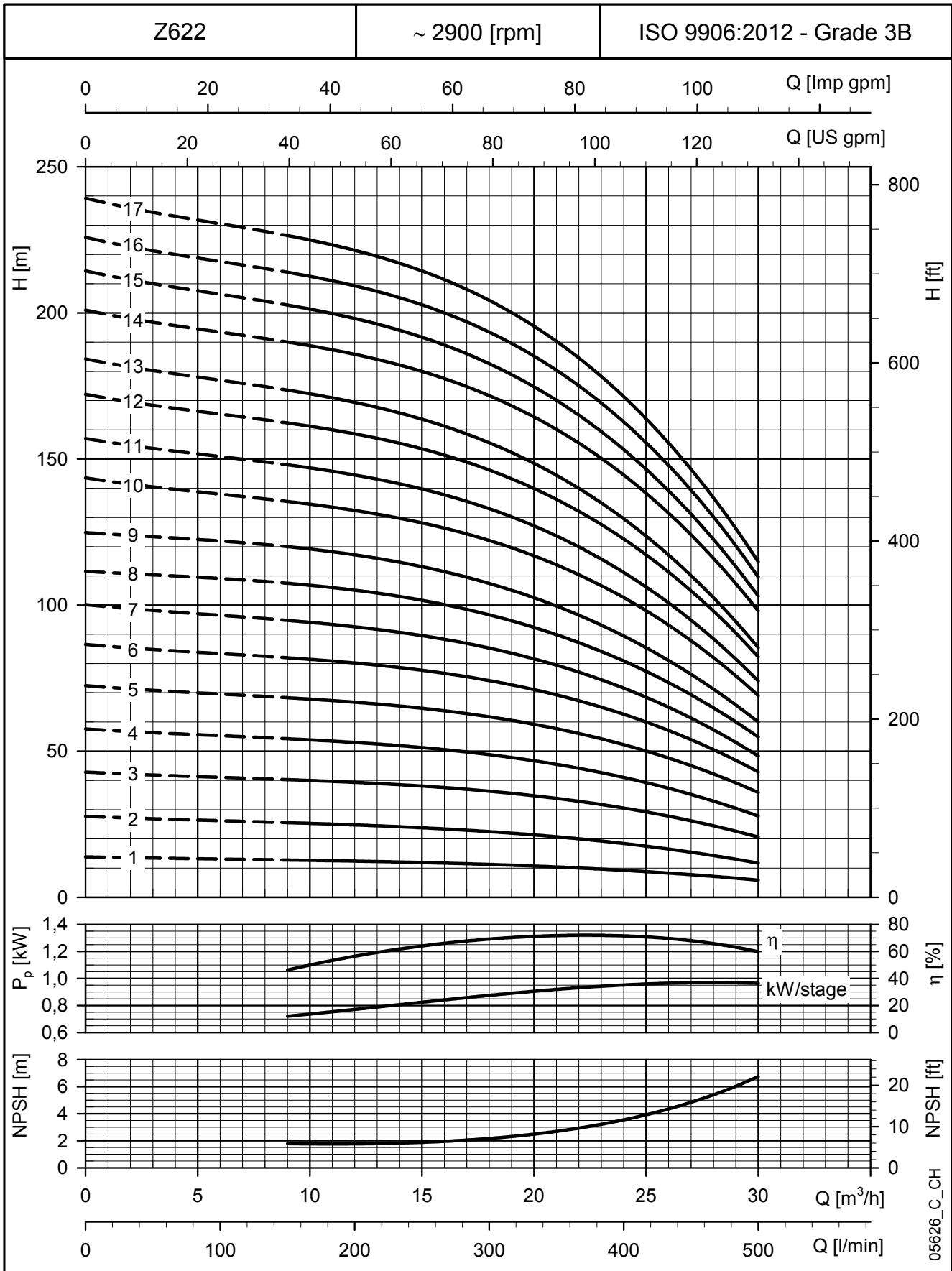


## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z622 01-L4C	1,1	643	286	357	142	144	17
Z622 02-L4C	2,2	819	393	426	142	144	23
Z622 03-L4C	3	1039	544	495	142	144	32
Z622 04-L4C	4	1178	614	564	142	144	38
Z622 05-L4C	5,5	1317	684	633	142	144	42
Z622 06-L4C	7,5	1466	764	702	142	144	46
Z622 07-L4C	7,5	1535	764	771	142	144	47
Z622 04-L6W	4	1147	583	564	144	146	52
Z622 05-L6W	5,5	1246	613	633	144	146	57
Z622 06-L6W	7,5	1355	653	702	144	146	63
Z622 07-L6W	7,5	1424	653	771	144	146	64
Z622 08-L6W	9,3	1523	683	840	144	146	70
Z622 09-L6W	9,3	1592	683	909	144	146	71
Z622 10-L6W	11	1701	723	978	144	146	77
Z622 11-L6W	11	1770	723	1047	144	146	78
Z622 12-L6W	13	1879	763	1116	144	146	84
Z622 13-L6W	13	1948	763	1185	144	146	85
Z622 14-L6W	15	2087	833	1254	144	146	95
Z622 15-L6W	15	2156	833	1323	144	146	97
Z622 16-L6W	18,5	2295	903	1392	144	146	106
Z622 17-L6W	18,5	2364	903	1461	144	146	108

z622-1-50-en\_a\_td

### Z622 SERIES, 1 TO 17 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

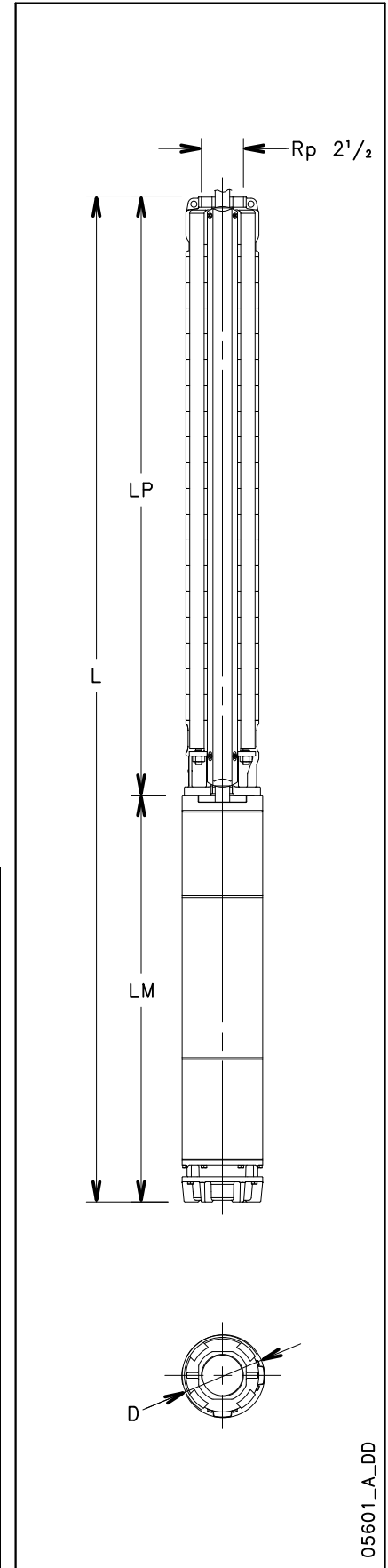


## Z622 SERIES, 18 TO 33 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	150	200	300	400	500
			m <sup>3</sup> /h	0	9	12	18	24	30
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z622 18	18,5	0,40	252,5	238,8	233,4	215,0	179,9	119,8	
Z622 19	22	0,40	271,9	257,0	251,1	231,5	194,8	132,7	
Z622 20	22	0,40	285,4	269,7	263,3	242,5	203,7	138,0	
Z622 21	22	0,40	298,8	282,3	275,6	253,4	212,3	143,2	
Z622 22	22	0,40	312,2	294,8	287,6	264,1	220,8	148,2	
Z622 23	26	0,40	331,0	313,1	306,1	282,8	238,8	163,9	
Z622 24	26	0,40	344,7	326,0	318,5	294,0	247,9	169,7	
Z622 25	26	0,40	358,3	338,8	330,9	305,1	256,8	175,2	
Z622 26	26	0,40	371,8	351,5	343,3	316,1	265,6	180,5	
Z622 27	30	0,40	387,8	367,1	359,5	333,1	281,2	190,5	
Z622 28	30	0,40	401,4	379,9	371,8	344,2	290,1	196,0	
Z622 29	30	0,40	415,0	392,7	384,2	355,3	299,0	201,4	
Z622 30	30	0,40	428,5	405,3	396,5	366,4	307,9	206,6	
Z622 31	37	0,40	443,9	421,8	413,2	383,1	323,7	220,1	
Z622 32	37	0,40	457,6	434,7	425,7	394,4	332,7	225,7	
Z622 33	37	0,40	471,2	447,5	438,1	405,5	341,6	231,0	

\* Efficiency index MEI

z622-2-50-en\_b\_th



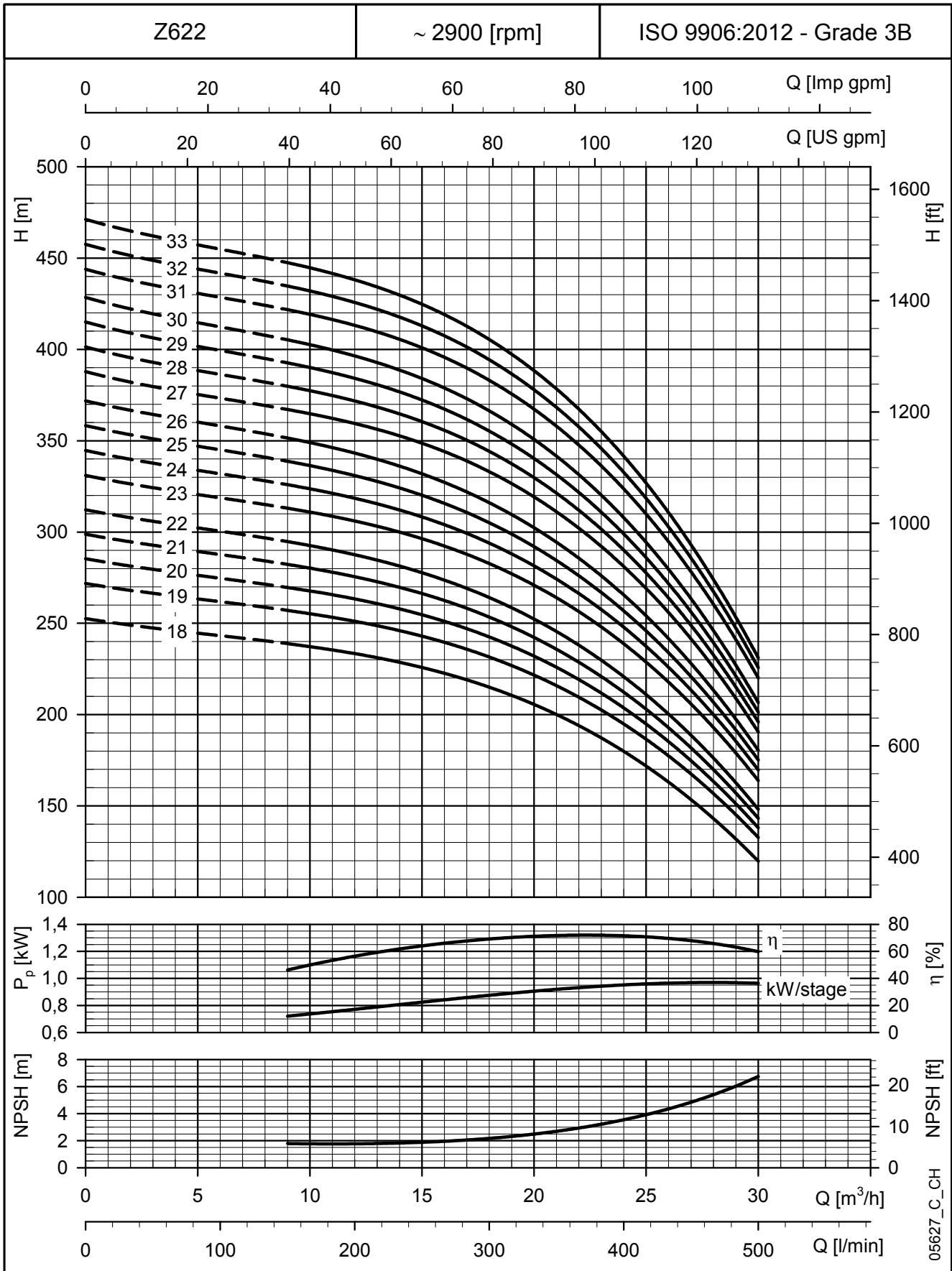
05601\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z622 18-L6W	18,5	2433	903	1530	144	146	109
Z622 19-L6W	22	2542	943	1599	144	146	114
Z622 20-L6W	22	2611	943	1668	144	146	116
Z622 21-L6W	22	2680	943	1737	144	146	117
Z622 22-L6W	22	2749	943	1806	144	146	119
Z622 23-L6W	26	2946	1071	1875	144	146	129
Z622 24-L6W	26	3015	1071	1944	144	146	131
Z622 25-L6W	26	3084	1071	2013	144	146	133
Z622 26-L6W	26	3153	1071	2082	144	146	134
Z622 27-L6W	30	3302	1151	2151	144	146	144
Z622 28-L6W	30	3371	1151	2220	144	146	145
Z622 29-L6W	30	3440	1151	2289	144	146	147
Z622 30-L6W	30	3509	1151	2358	144	146	148
Z622 31-L6W	37	3728	1301	2427	144	146	164
Z622 32-L6W	37	3797	1301	2496	144	146	165
Z622 33-L6W	37	3866	1301	2565	144	146	167

z622-2-50-en\_a\_td

### Z622 SERIES, 18 TO 33 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



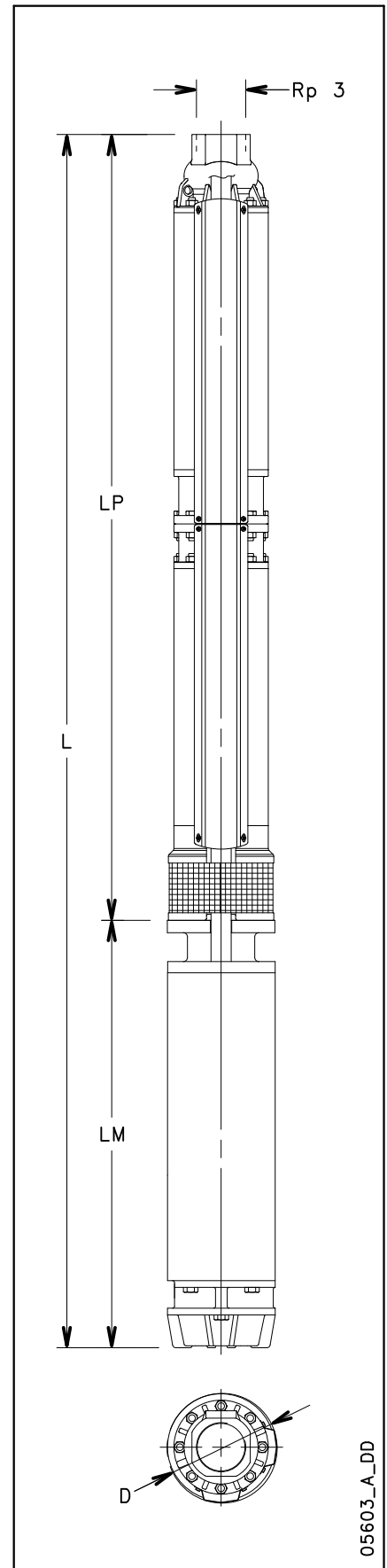
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z622 SERIES, 34 TO 50 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	150	200	300	400	500
			m <sup>3</sup> /h	0	9	12	18	24	30
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z622 34D	37	0,40	484,7	460,1	450,3	416,6	350,5	236,4	
Z622 35D	37	0,40	498,3	472,9	462,7	427,5	359,1	241,4	
Z622 36D	37	0,40	511,8	485,5	474,9	438,4	367,8	246,5	
Z622 37D	37	0,40	525,2	498,1	487,0	449,1	376,1	251,2	
Z622 38D	45	0,40	543,0	515,3	504,6	467,5	394,4	267,3	
Z622 39D	45	0,40	556,5	528,1	517,0	478,7	403,5	272,9	
Z622 40D	45	0,40	570,0	540,8	529,4	489,9	412,5	278,1	
Z622 41D	45	0,40	583,5	553,4	541,6	500,9	421,2	283,3	
Z622 42D	45	0,40	596,9	566,0	553,9	512,0	430,1	288,7	
Z622 43D	45	0,40	610,3	578,5	566,0	522,9	439,0	294,0	
Z622 44D	45	0,40	623,9	591,1	578,1	533,8	447,7	299,1	
Z622 45D	45	0,40	637,2	603,6	590,3	544,6	456,3	304,1	
Z622 46D	52	0,40	656,3	622,9	609,8	564,4	475,5	321,1	
Z622 47D	52	0,40	669,7	635,5	622,1	575,5	484,3	326,4	
Z622 48D	52	0,40	683,5	648,4	634,5	586,5	493,0	331,5	
Z622 49D	52	0,40	696,6	661,1	646,8	597,4	501,6	336,7	
Z622 50D	52	0,40	710,2	673,6	658,9	608,3	510,4	341,8	

\* Efficiency index MEI

z622-3-50-en\_b\_th



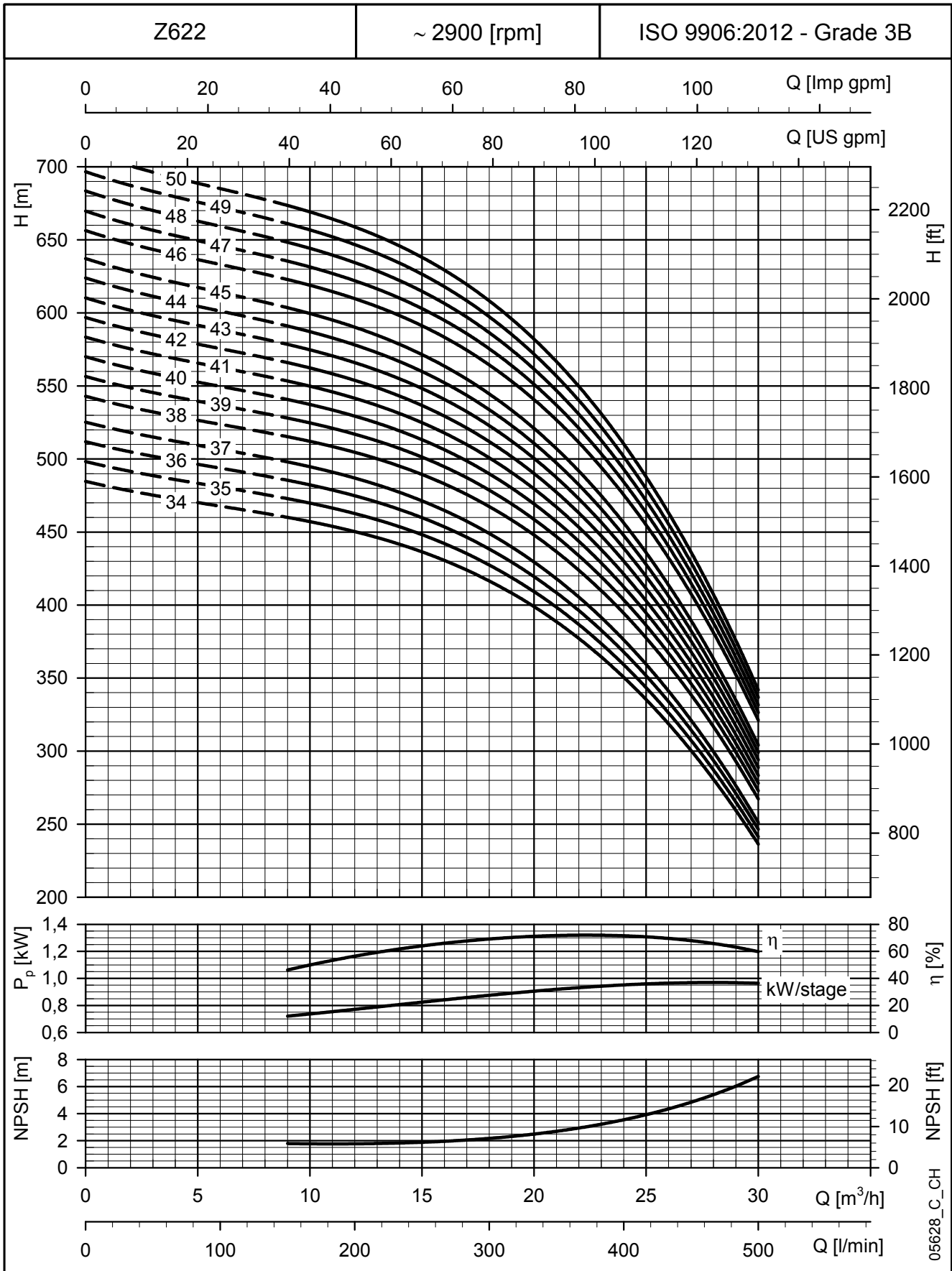
05603\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z622 34D-L6W	37	4223	1301	2922	177	180	221
Z622 35D-L6W	37	4637	1301	3336	177	180	233
Z622 36D-L6W	37	4637	1301	3336	177	180	234
Z622 37D-L6W	37	4637	1301	3336	177	180	235
Z622 38D-L8W	45	4520	1135	3385	193	195	310
Z622 39D-L8W	45	4520	1135	3385	193	195	311
Z622 40D-L8W	45	4520	1135	3385	193	195	311
Z622 41D-L8W	45	4658	1135	3523	193	195	315
Z622 42D-L8W	45	4658	1135	3523	193	195	316
Z622 43D-L8W	45	4796	1135	3661	193	195	321
Z622 44D-L8W	45	4796	1135	3661	193	195	321
Z622 45D-L8W	45	5003	1135	3868	193	195	327
Z622 46D-L8W	52	5083	1215	3868	193	195	348
Z622 47D-L8W	52	5083	1215	3868	193	195	348
Z622 48D-L8W	52	5290	1215	4075	193	195	355
Z622 49D-L8W	52	5290	1215	4075	193	195	356
Z622 50D-L8W	52	5360	1215	4075	193	195	357

z622-3-50-en\_b\_td

**Z622 SERIES, 34 TO 50 STAGES**  
**ELECTROPUMPS OPERATING CHARACTERISTICS**



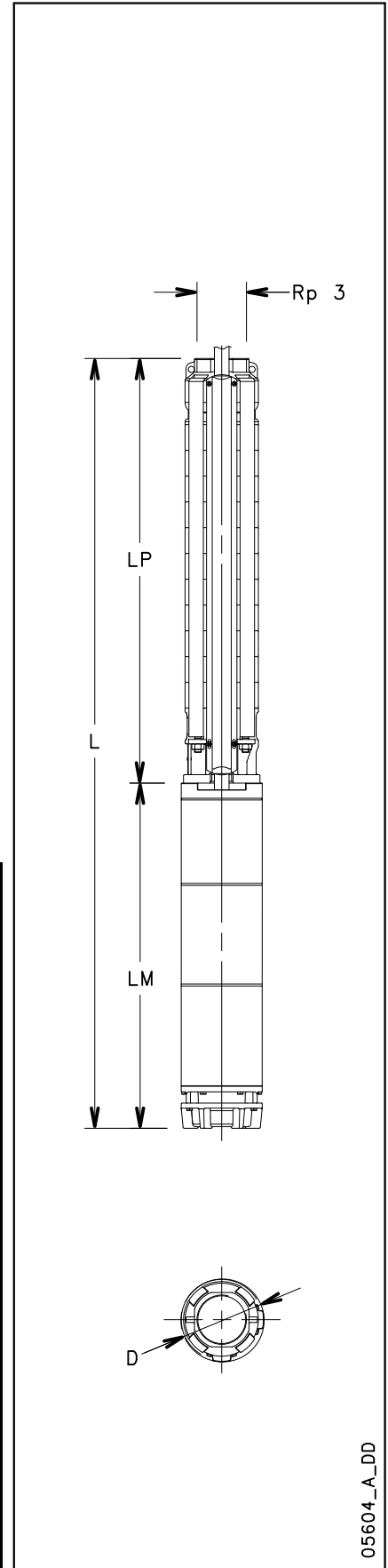
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z631 SERIES, 1 TO 15 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	200	400	500	600	667
			m <sup>3</sup> /h	0	12	24	30	36	40
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z631 01	1,5	0,40	15,6	14,3	12,3	10,7	8,5	6,6	
Z631 02	3	0,40	31,7	29,3	25,4	22,2	17,8	14,1	
Z631 03	4	0,40	47,4	43,8	37,9	33,1	26,4	20,7	
Z631 04	5,5	0,40	63,1	58,8	51,3	45,1	36,5	29,2	
Z631 05	7,5	0,40	78,7	73,4	64,0	56,2	45,4	36,3	
Z631 06	7,5	0,40	93,9	87,2	75,9	66,6	53,7	42,9	
Z631 07	9,3	0,40	109,2	102,7	89,9	79,1	64,2	51,5	
Z631 08	11	0,40	124,7	117,3	102,9	90,6	73,5	59,1	
Z631 09	11	0,40	139,8	130,8	114,0	100,0	80,9	64,7	
Z631 10	13	0,40	155,7	145,9	127,5	112,0	90,9	73,0	
Z631 11	15	0,40	171,8	161,1	141,2	124,4	101,2	81,6	
Z631 12	18,5	0,40	188,1	177,5	156,4	138,3	113,2	91,9	
Z631 13	18,5	0,40	203,0	191,4	168,2	148,4	121,1	97,9	
Z631 14	18,5	0,40	218,0	205,2	179,8	158,3	128,7	103,6	
Z631 15	22	0,40	233,6	219,3	192,3	169,5	138,1	111,4	

\* Efficiency index MEI

z631-1-50-en\_b\_th



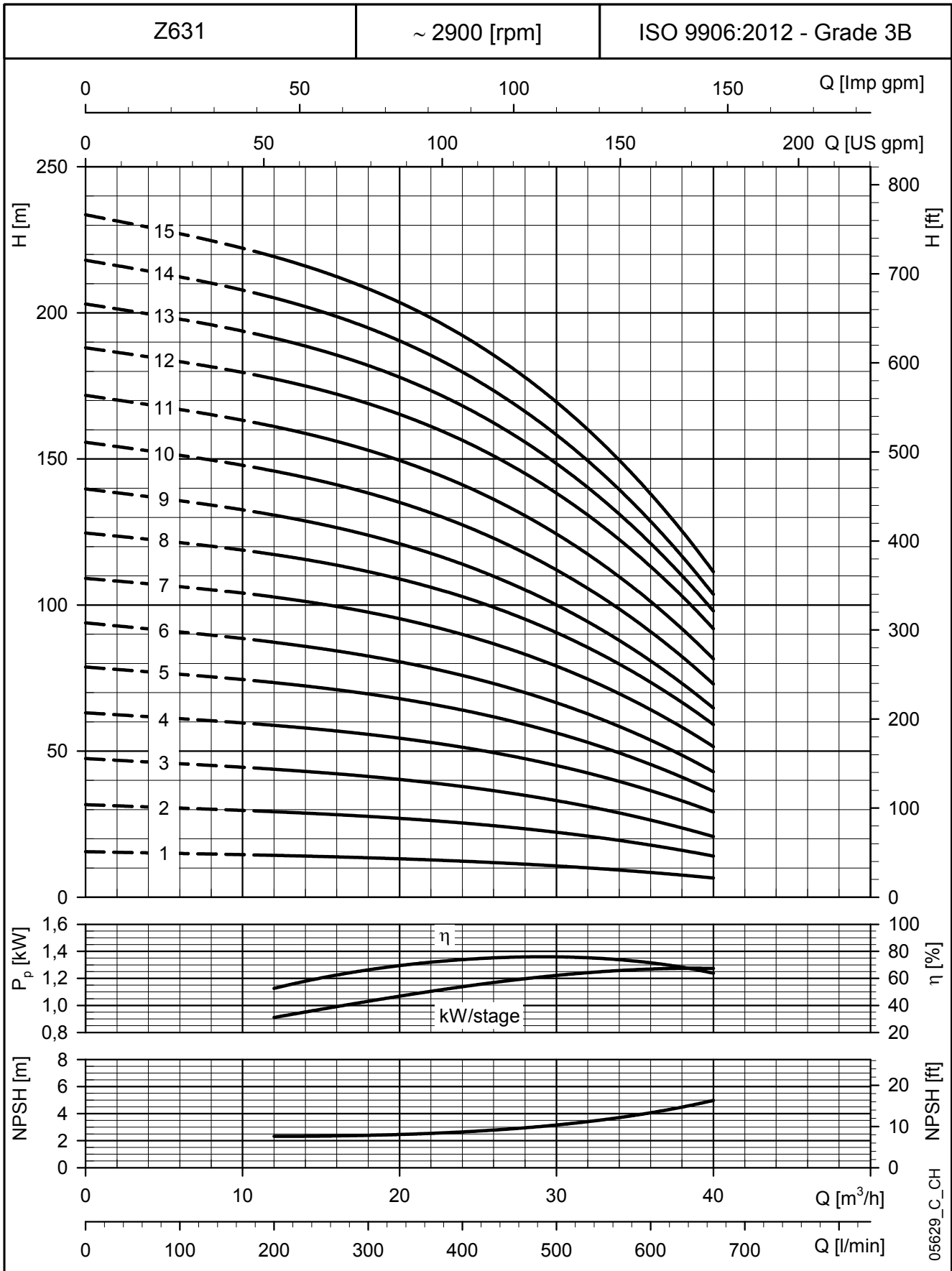
05604\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z631 01-L4C	1,5	715	348	367	142	144	21
Z631 02-L4C	3	980	544	436	142	144	31
Z631 03-L4C	4	1119	614	505	142	144	35
Z631 04-L4C	5,5	1258	684	574	142	144	40
Z631 05-L4C	7,5	1407	764	643	142	144	44
Z631 06-L4C	7,5	1476	764	712	142	144	46
Z631 03-L6W	4	1088	583	505	144	146	50
Z631 04-L6W	5,5	1187	613	574	144	146	56
Z631 05-L6W	7,5	1296	653	643	144	146	61
Z631 06-L6W	7,5	1365	653	712	144	146	63
Z631 07-L6W	9,3	1464	683	781	144	146	67
Z631 08-L6W	11	1573	723	850	144	146	74
Z631 09-L6W	11	1642	723	919	144	146	75
Z631 10-L6W	13	1751	763	988	144	146	81
Z631 11-L6W	15	1890	833	1057	144	146	90
Z631 12-L6W	18,5	2029	903	1126	144	146	100
Z631 13-L6W	18,5	2098	903	1195	144	146	101
Z631 14-L6W	18,5	2167	903	1264	144	146	103
Z631 15-L6W	22	2276	943	1333	144	146	108

z631-1-50-en\_a\_td

### Z631 SERIES, 1 TO 15 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



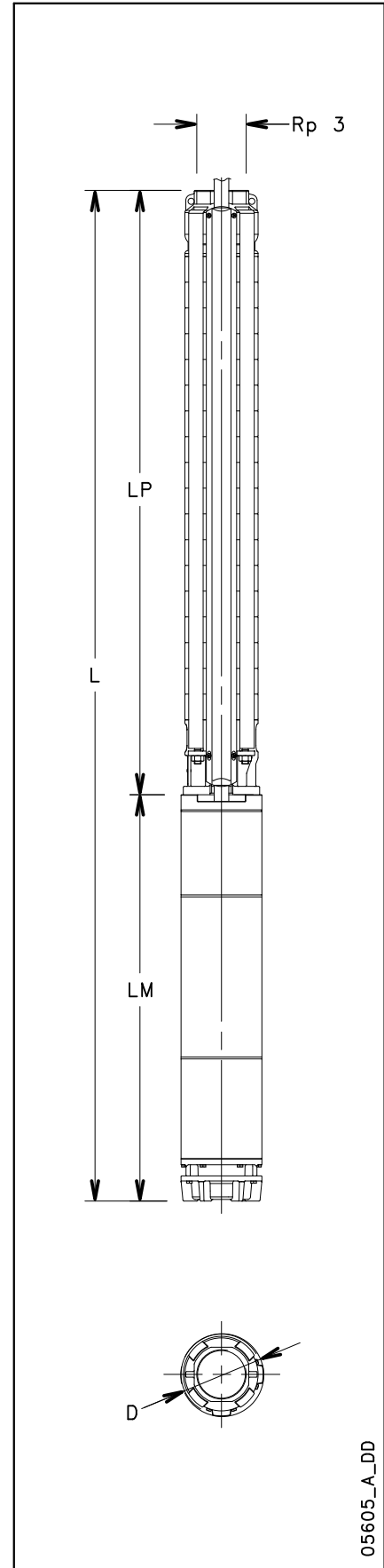
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z631 SERIES, 16 TO 29 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	200	400	500	600	667
			m <sup>3</sup> /h	0	12	24	30	36	40,0002
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z631 16	22	0,40	248,5	233,0	203,9	179,4	145,7	117,2	
Z631 17	22	0,40	262,4	246,9	215,9	189,7	153,7	123,2	
Z631 18	26	0,40	280,6	265,1	233,8	206,7	169,1	137,1	
Z631 19	26	0,40	295,5	279,2	245,7	217,0	177,1	143,2	
Z631 20	26	0,40	310,6	292,9	257,5	227,0	185,0	149,2	
Z631 21	30	0,40	327,0	308,8	271,8	240,0	195,9	158,5	
Z631 22	30	0,40	342,0	322,5	283,5	250,1	203,8	164,5	
Z631 23	30	0,40	357,2	336,7	296,0	260,7	211,6	169,7	
Z631 24	37	0,40	376,2	355,7	314,1	277,7	226,5	182,8	
Z631 25	37	0,40	389,6	367,9	324,5	286,5	233,4	188,0	
Z631 26	37	0,40	404,7	381,8	336,1	296,4	241,0	193,7	
Z631 27	37	0,40	419,6	395,6	347,8	306,3	248,6	199,4	
Z631 28	37	0,40	434,5	409,4	359,3	316,0	255,9	204,8	
Z631 29	37	0,40	449,1	423,1	370,7	325,6	263,1	210,0	

\* Efficiency index MEI

z631-2-50-en\_b\_th



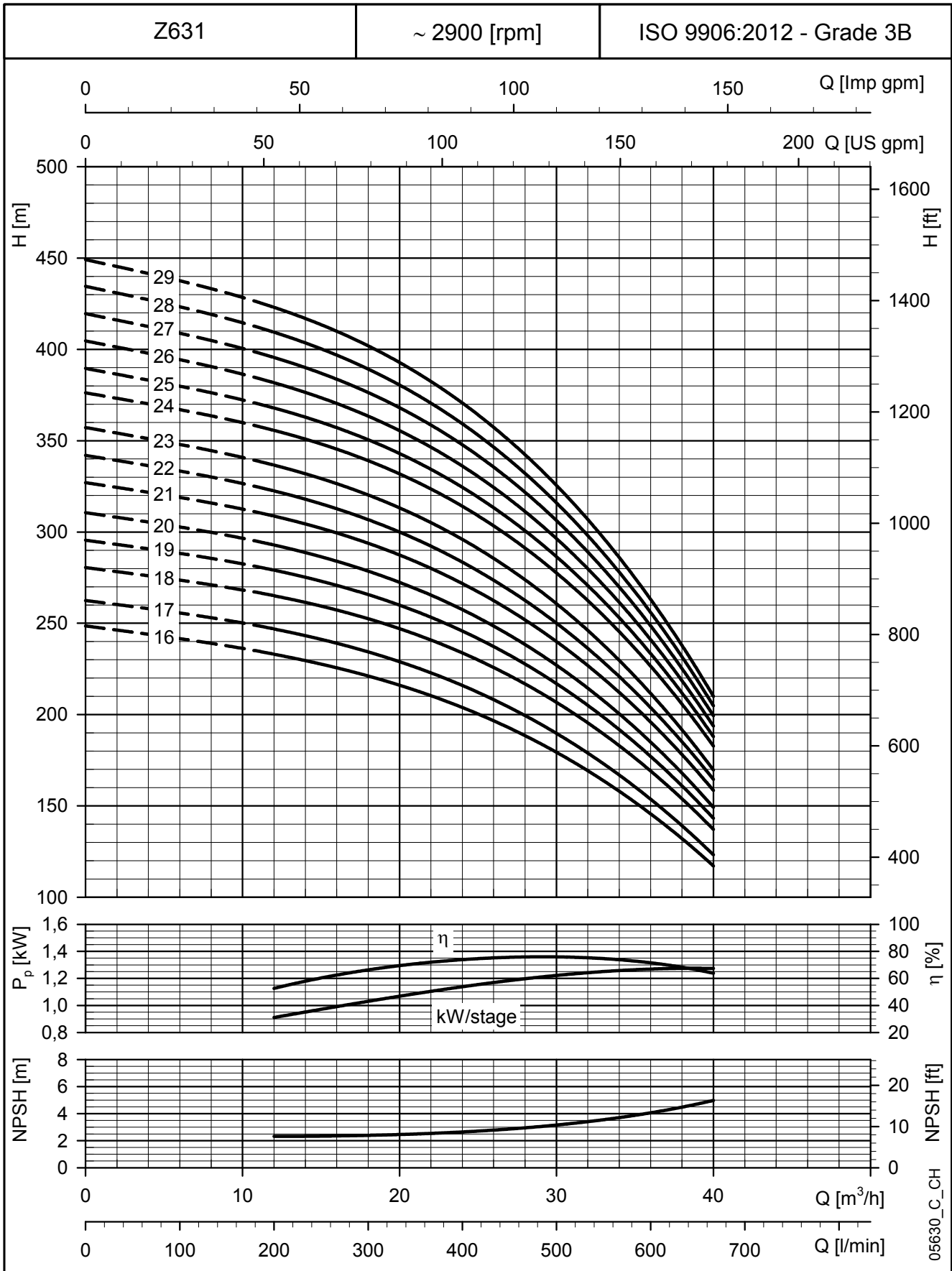
05605\_A\_DD

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z631 16-L6W	22	2345	943	1402	144	146	109
Z631 17-L6W	22	2414	943	1471	144	146	111
Z631 18-L6W	26	2611	1071	1540	144	146	121
Z631 19-L6W	26	2680	1071	1609	144	146	123
Z631 20-L6W	26	2749	1071	1678	144	146	124
Z631 21-L6W	30	2898	1151	1747	144	146	134
Z631 22-L6W	30	2967	1151	1816	144	146	136
Z631 23-L6W	30	3036	1151	1885	144	146	137
Z631 24-L6W	37	3255	1301	1954	144	146	153
Z631 25-L6W	37	3324	1301	2023	144	146	154
Z631 26-L6W	37	3393	1301	2092	144	146	156
Z631 27-L6W	37	3462	1301	2161	144	146	158
Z631 28-L6W	37	3531	1301	2230	144	146	159
Z631 29-L6W	37	3600	1301	2299	144	146	161

z631-2-50-en\_a\_td

**Z631 SERIES, 16 TO 29 STAGES**  
**ELECTROPUMPS OPERATING CHARACTERISTICS**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

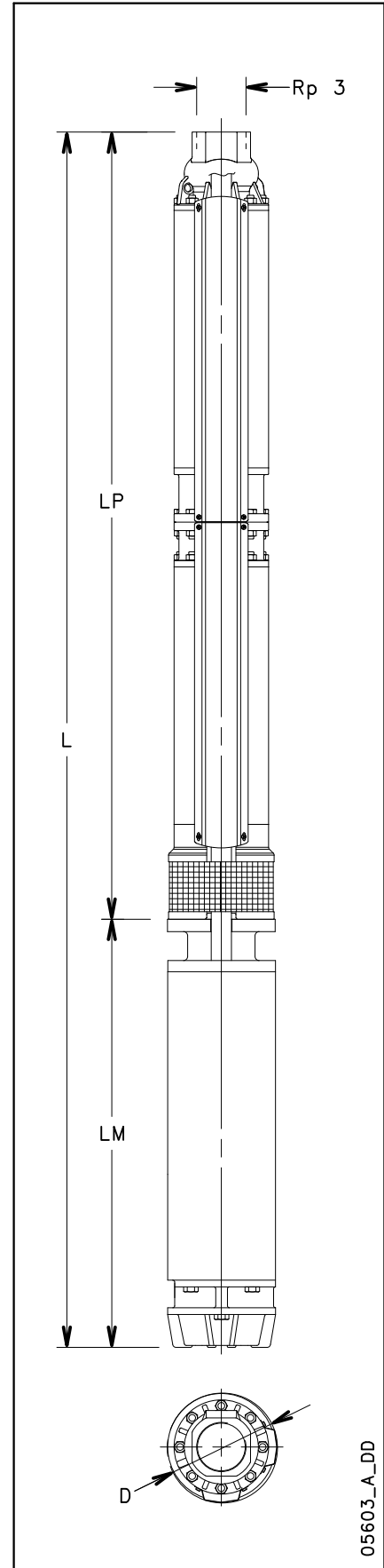


## Z631 SERIES, 30 TO 43 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY						
			l/min	0	200	400	500	600	667
			m <sup>3</sup> /h	0	12	24	30	36	40
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z631 30D	45	0,40	467,2	440,6	388,4	342,8	279,1	224,5	
Z631 31D	45	0,40	482,2	454,3	400,1	352,9	286,9	230,4	
Z631 32D	45	0,40	497,1	468,1	411,8	362,9	294,7	236,3	
Z631 33D	45	0,40	511,9	481,7	423,4	372,9	302,3	242,1	
Z631 34D	45	0,40	526,7	495,5	434,8	382,4	309,6	247,5	
Z631 35D	45	0,40	541,4	509,1	446,3	392,2	317,1	253,0	
Z631 36D	52	0,40	556,2	522,5	457,5	401,8	324,3	258,3	
Z631 37D	52	0,40	574,7	542,0	476,8	420,1	341,1	273,7	
Z631 38D	52	0,40	589,8	555,8	488,3	429,9	348,5	279,2	
Z631 39D	52	0,40	604,5	569,4	499,8	439,6	355,9	284,6	
Z631 40D	52	0,40	619,4	583,1	511,1	449,2	363,2	290,0	
Z631 41D	52	0,40	634,1	596,7	522,4	458,6	370,3	295,2	
Z631 42D	55	0,40	652,3	614,8	540,5	476,1	386,4	309,8	
Z631 43D	55	0,40	667,0	628,4	552,0	485,9	393,9	315,4	

\* Efficiency index MEI

z631-3-50-en\_b\_th

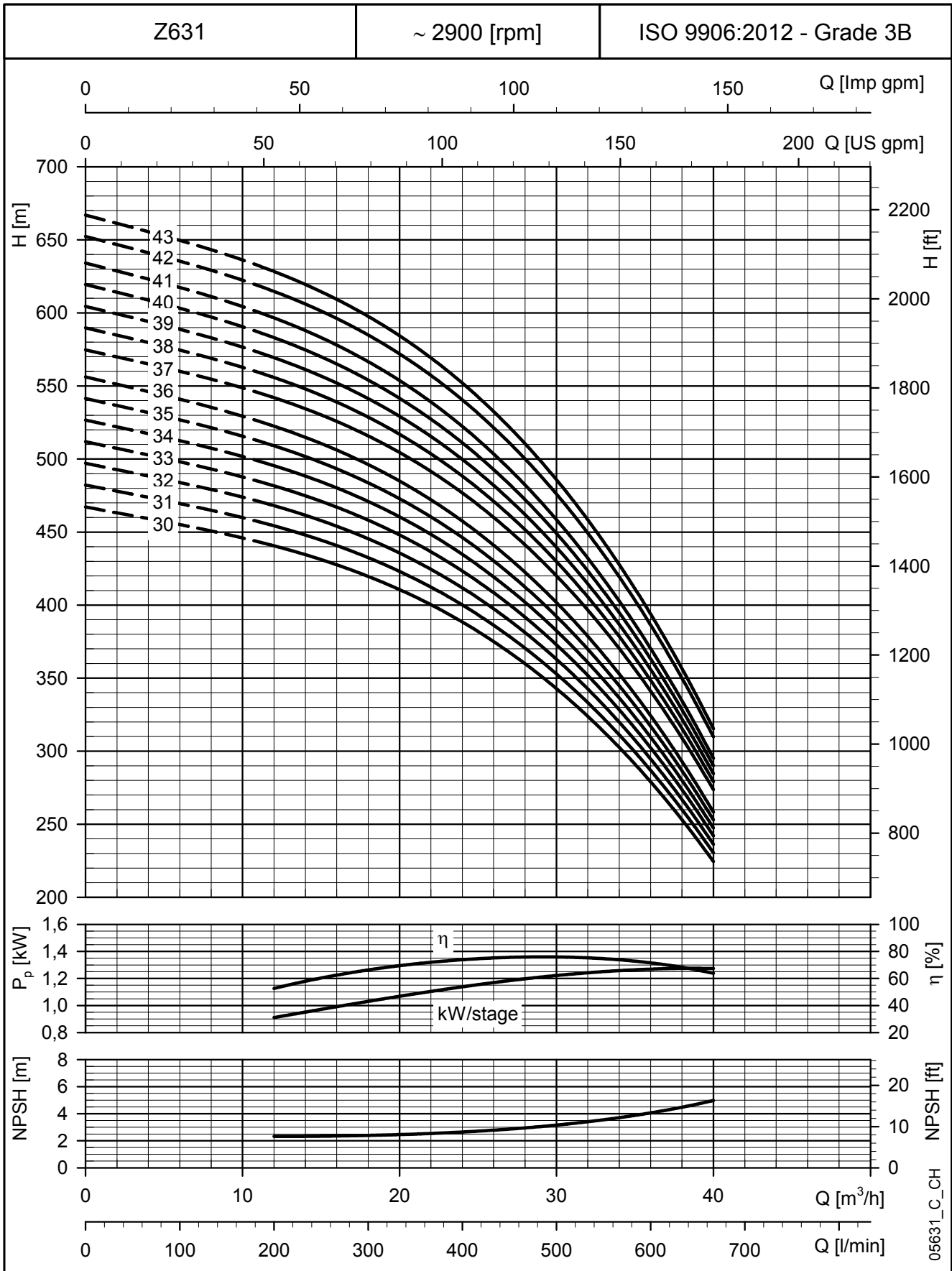


## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z631 30D-L8W	45	4106	1135	2971	193	195	292
Z631 31D-L8W	45	4106	1135	2971	193	195	293
Z631 32D-L8W	45	4106	1135	2971	193	195	294
Z631 33D-L8W	45	4106	1135	2971	193	195	295
Z631 34D-L8W	45	4106	1135	2971	193	195	295
Z631 35D-L8W	45	4520	1135	3385	193	195	308
Z631 36D-L8W	52	4600	1215	3385	193	195	328
Z631 37D-L8W	52	4600	1215	3385	193	195	329
Z631 38D-L8W	52	4600	1215	3385	193	195	330
Z631 39D-L8W	52	4600	1215	3385	193	195	331
Z631 40D-L8W	52	4600	1215	3385	193	195	331
Z631 41D-L8W	52	4738	1215	3523	193	195	335
Z631 42D-L8W	55	4768	1245	3523	193	195	342
Z631 43D-L8W	55	4906	1245	3661	193	195	347

z631-3-50-en\_b\_td

### Z631 SERIES, 30 TO 43 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z646 SERIES, 1 TO 12 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

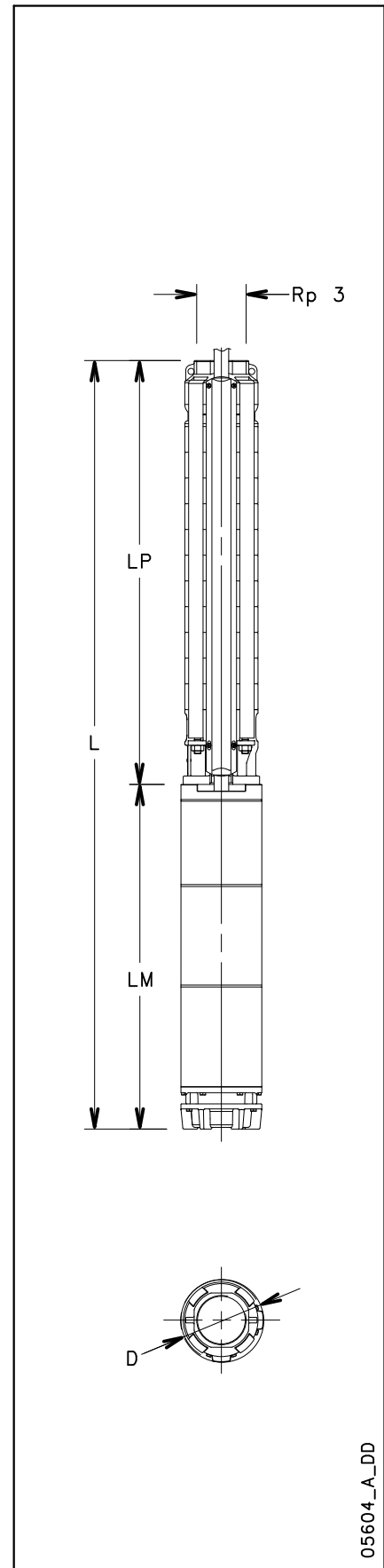
PUMP TYPE	RATED POWER		Q = DELIVERY						
			$v_{min}$	0	400	600	700	800	1000
			$m^3/h$	0	24	36	42	48	60
			H = TOTAL HEAD METRES COLUMN OF WATER						
Z646 01	1,5	0,40	16,9	11,4	9,0	7,9	6,7	3,0	
Z646 02	3	0,40	35,1	24,0	19,4	17,4	15,2	8,8	
Z646 03	5,5	0,40	52,3	35,9	29,3	26,4	23,3	14,0	
Z646 04	7,5	0,40	69,0	47,6	39,0	35,3	31,2	18,9	
Z646 05	7,5	0,40	83,1	58,1	47,7	43,1	38,1	22,7	
Z646 06	9,3	0,40	100,6	70,1	57,6	52,1	46,2	27,9	
Z646 07	11	0,40	117,3	81,7	67,3	60,9	54,0	32,7	
Z646 08	13	0,40	137,1	93,4	76,7	69,5	61,6	36,9	
Z646 09	13	0,40	152,7	106,0	87,4	79,3	70,5	43,5	
Z646 10	15	0,40	166,8	116,3	95,9	86,9	77,2	47,0	
Z646 11	18,5	0,40	186,9	129,8	107,1	97,2	86,5	53,7	
Z646 12	18,5	0,40	201,2	140,2	115,7	105,0	93,3	57,3	

\* Efficiency index MEI

z646-1-50-en\_b\_th

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

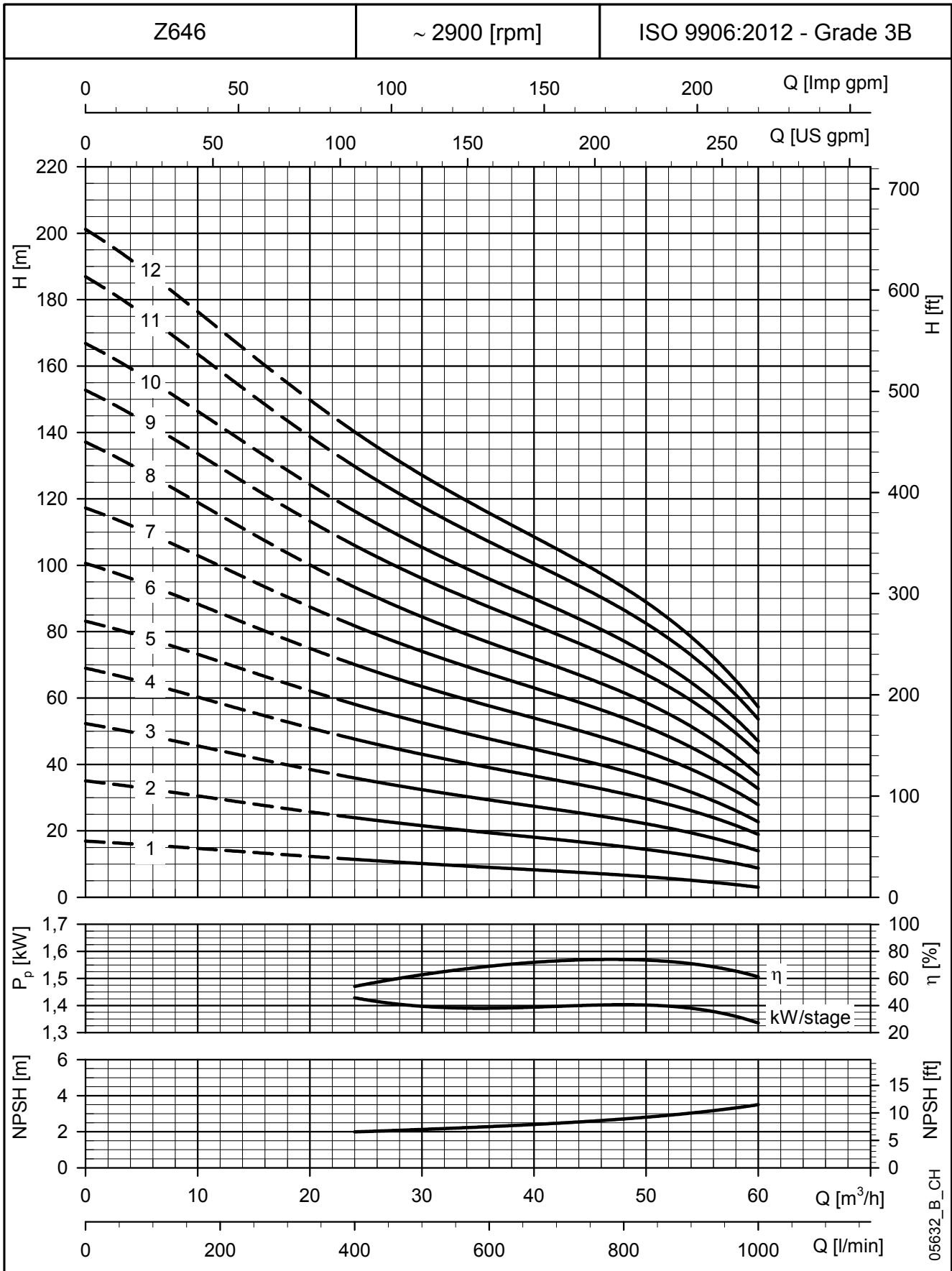
ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z646 01-L4C	1,5	761	348	413	142	144	22
Z646 02-L4C	3	1072	544	528	142	144	32
Z646 03-L4C	5,5	1327	684	643	142	144	42
Z646 04-L4C	7,5	1522	764	758	142	144	46
Z646 05-L4C	7,5	1637	764	873	142	144	49
Z646 03-L6W	5,5	1256	613	643	144	146	57
Z646 04-L6W	7,5	1411	653	758	144	146	63
Z646 05-L6W	7,5	1526	653	873	144	146	66
Z646 06-L6W	9,3	1671	683	988	144	146	72
Z646 07-L6W	11	1826	723	1103	144	146	79
Z646 08-L6W	13	1981	763	1218	144	146	85
Z646 09-L6W	13	2096	763	1333	144	146	88
Z646 10-L6W	15	2281	833	1448	144	146	98
Z646 11-L6W	18,5	2466	903	1563	144	146	109
Z646 12-L6W	18,5	2581	903	1678	144	146	111



05604\_A\_DD

z646-1-50-en\_a\_td

### Z646 SERIES, 1 TO 12 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z646 SERIES, 13 TO 25 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

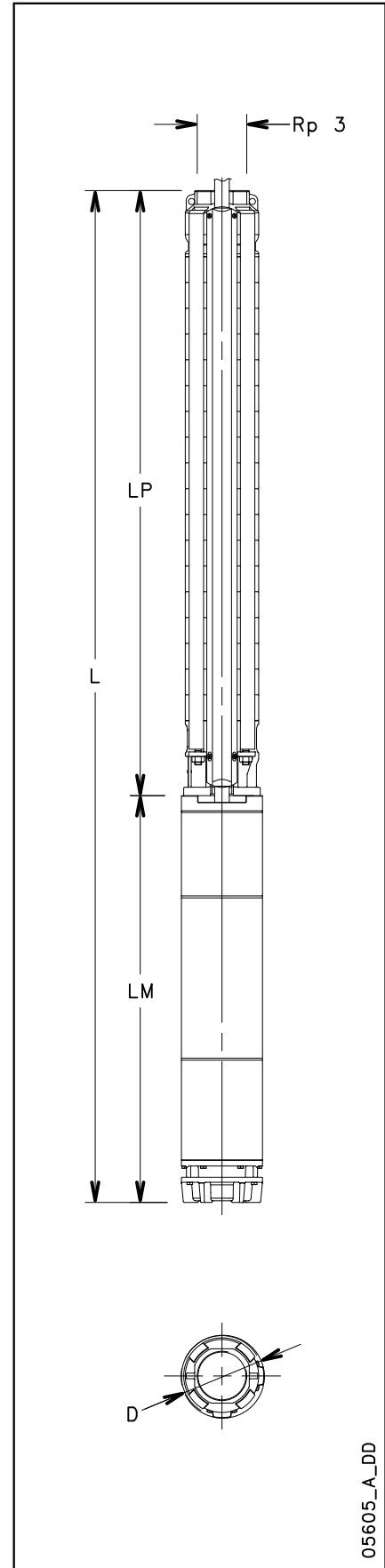
PUMP TYPE	RATED POWER		Q = DELIVERY					
			l/min	400	600	700	800	1000
			0	24	36	42	48	60
	kW	MEI* ≥	H = TOTAL HEAD METRES COLUMN OF WATER					
Z646 13	22	0,40	221,6	154,4	127,5	115,9	103,3	64,8
Z646 14	22	0,40	235,4	164,9	136,2	123,7	110,2	68,6
Z646 15	22	0,40	248,8	175,0	144,6	131,2	116,8	72,1
Z646 16	26	0,40	276,0	191,7	158,6	144,2	128,8	82,0
Z646 17	26	0,40	290,6	202,4	167,4	152,2	135,8	86,0
Z646 18	30	0,40	310,0	215,4	178,3	162,2	144,9	92,1
Z646 19	30	0,40	324,7	226,1	187,1	170,1	151,9	96,1
Z646 20	30	0,40	339,1	236,7	195,8	177,9	158,7	100,0
Z646 21	37	0,40	361,2	251,8	208,4	189,6	169,5	108,2
Z646 22	37	0,40	375,7	262,5	217,3	197,7	176,6	112,3
Z646 23	37	0,40	389,8	273,0	225,9	205,4	183,4	116,0
Z646 24	37	0,40	403,6	283,3	234,5	213,2	190,2	119,6
Z646 25	37	0,40	417,1	293,6	243,0	220,8	196,8	123,1

\* Efficiency index MEI

z646-2-50-en\_b\_th

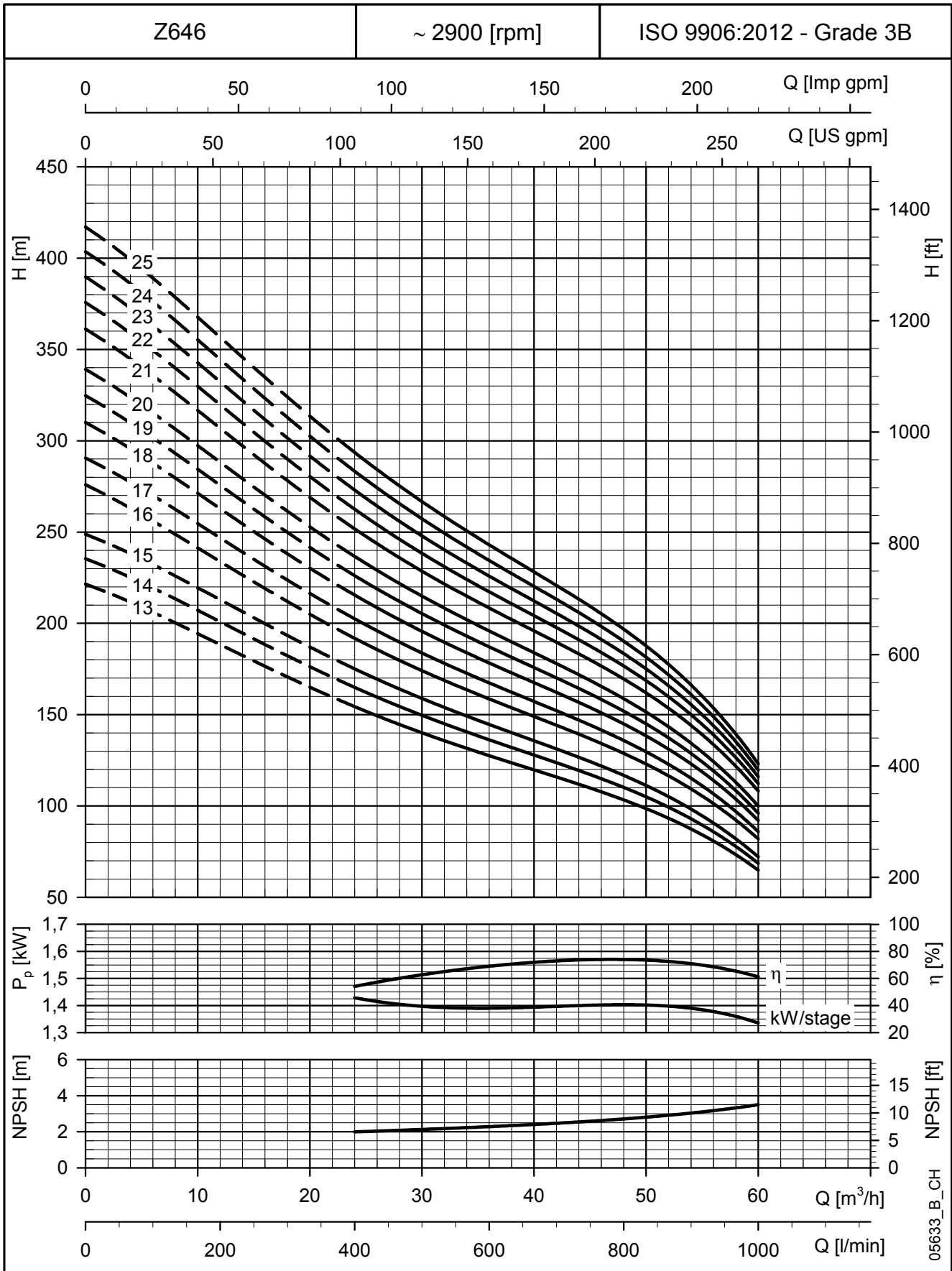
## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z646 13-L6W	22	2736	943	1793	144	146	117
Z646 14-L6W	22	2851	943	1908	144	146	119
Z646 15-L6W	22	2966	943	2023	144	146	122
Z646 16-L6W	26	3209	1071	2138	144	146	133
Z646 17-L6W	26	3324	1071	2253	144	146	136
Z646 18-L6W	30	3519	1151	2368	144	146	146
Z646 19-L6W	30	3634	1151	2483	144	146	149
Z646 20-L6W	30	3749	1151	2598	144	146	151
Z646 21-L6W	37	4014	1301	2713	144	146	168
Z646 22-L6W	37	4129	1301	2828	144	146	170
Z646 23-L6W	37	4244	1301	2943	144	146	173
Z646 24-L6W	37	4359	1301	3058	144	146	175
Z646 25-L6W	37	4474	1301	3173	144	146	178



z646-2-50-en\_a\_td

### Z646 SERIES, 13 TO 25 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



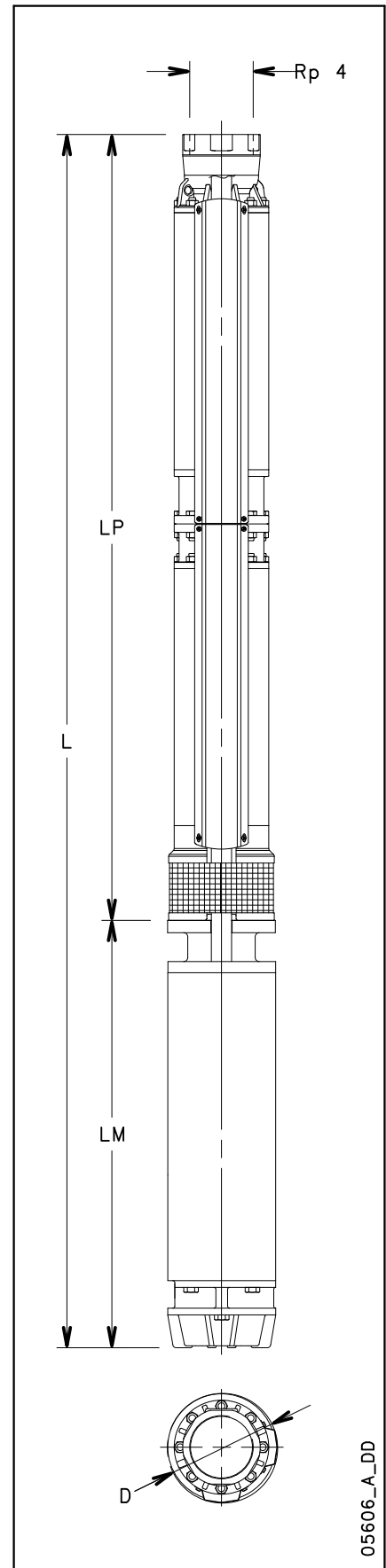
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z646 SERIES, 26 TO 37 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

PUMP TYPE	RATED POWER		Q = DELIVERY					
			l/min	400	600	700	800	1000
			0	24	36	42	48	60
	kW	MEI* $\geq$	H = TOTAL HEAD METRES COLUMN OF WATER					
			0	0	0	0	0	0
Z646 26D	45	0,40	447,2	310,1	256,7	233,6	208,7	132,7
Z646 27D	45	0,40	462,1	320,8	265,5	241,5	215,6	136,5
Z646 28D	45	0,40	476,8	331,4	274,2	249,4	222,6	140,5
Z646 29D	45	0,40	491,8	341,8	282,9	257,2	229,5	144,0
Z646 30D	45	0,40	506,1	352,2	291,5	264,9	236,2	147,8
Z646 31D	45	0,40	520,4	362,4	299,9	272,5	242,9	151,2
Z646 32D	52	0,40	543,0	379,6	314,3	285,9	255,3	161,9
Z646 33D	52	0,40	557,2	390,0	323,0	293,7	262,1	165,5
Z646 34D	52	0,40	570,9	400,2	331,3	301,2	268,8	169,2
Z646 35D	52	0,40	584,7	410,5	339,9	308,9	275,4	172,4
Z646 36D	52	0,40	598,0	420,4	348,1	316,3	281,9	175,9
Z646 37D	55	0,40	626,5	437,4	362,2	329,4	294,0	185,8

\* Efficiency index MEI

z646-3-50-en\_b\_th

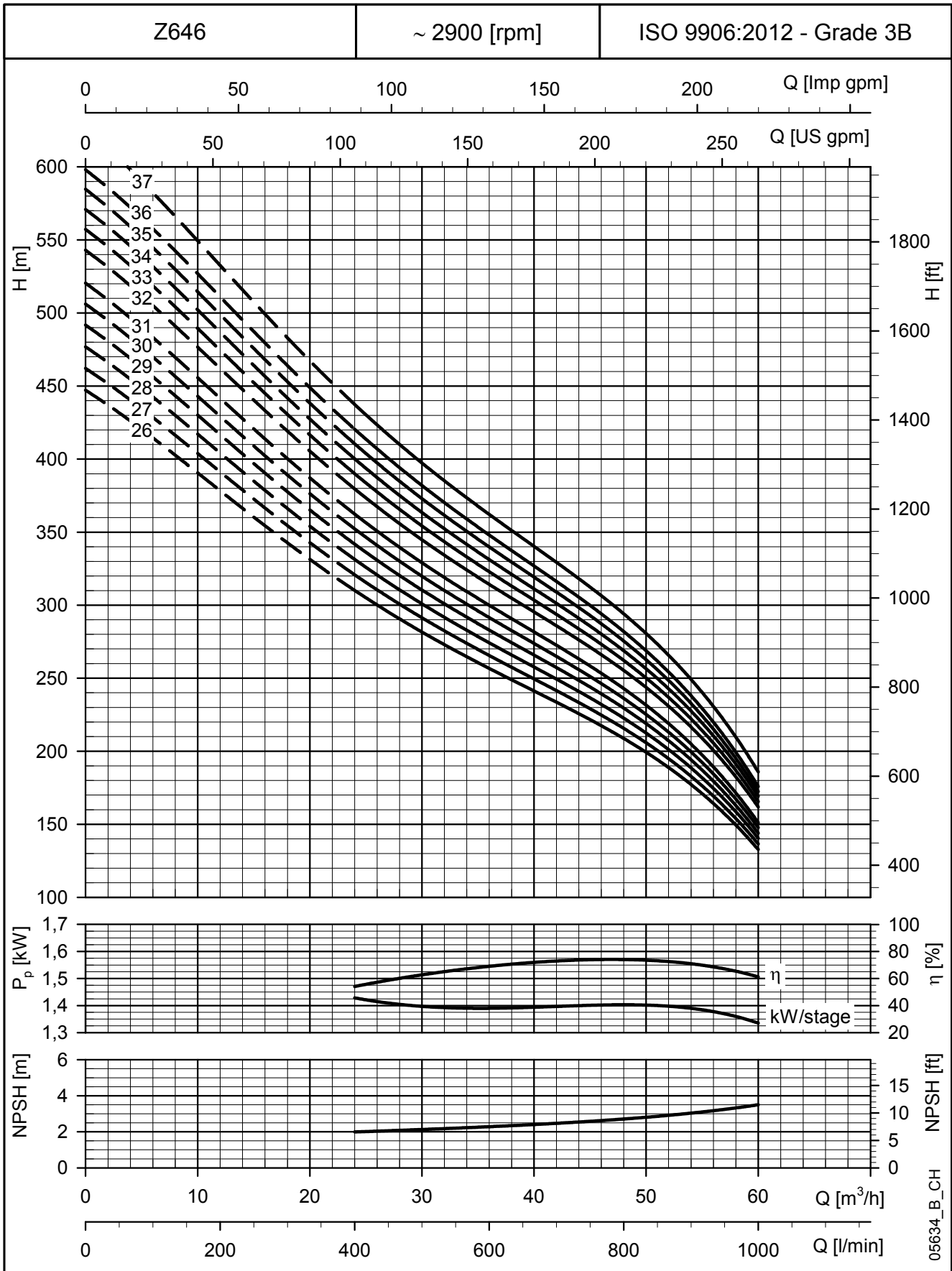


## ELECTROPUMPS DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z646 26D-L8W	45	4865	1135	3730	193	195	320
Z646 27D-L8W	45	4865	1135	3730	193	195	322
Z646 28D-L8W	45	5210	1135	4075	193	195	332
Z646 29D-L8W	45	5210	1135	4075	193	195	333
Z646 30D-L8W	45	5210	1135	4075	193	195	335
Z646 31D-L8W	45	5325	1135	4190	193	195	337
Z646 32D-L8W	52	5750	1215	4535	193	195	367
Z646 33D-L8W	52	5750	1215	4535	193	195	368
Z646 34D-L8W	52	5750	1215	4535	193	195	370
Z646 35D-L8W	52	6210	1215	4995	193	195	383
Z646 36D-L8W	52	6210	1215	4995	193	195	384
Z646 37D-L8W	55	6240	1245	4995	193	195	392

z646-3-50-en\_b\_td

### Z646 SERIES, 26 TO 37 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

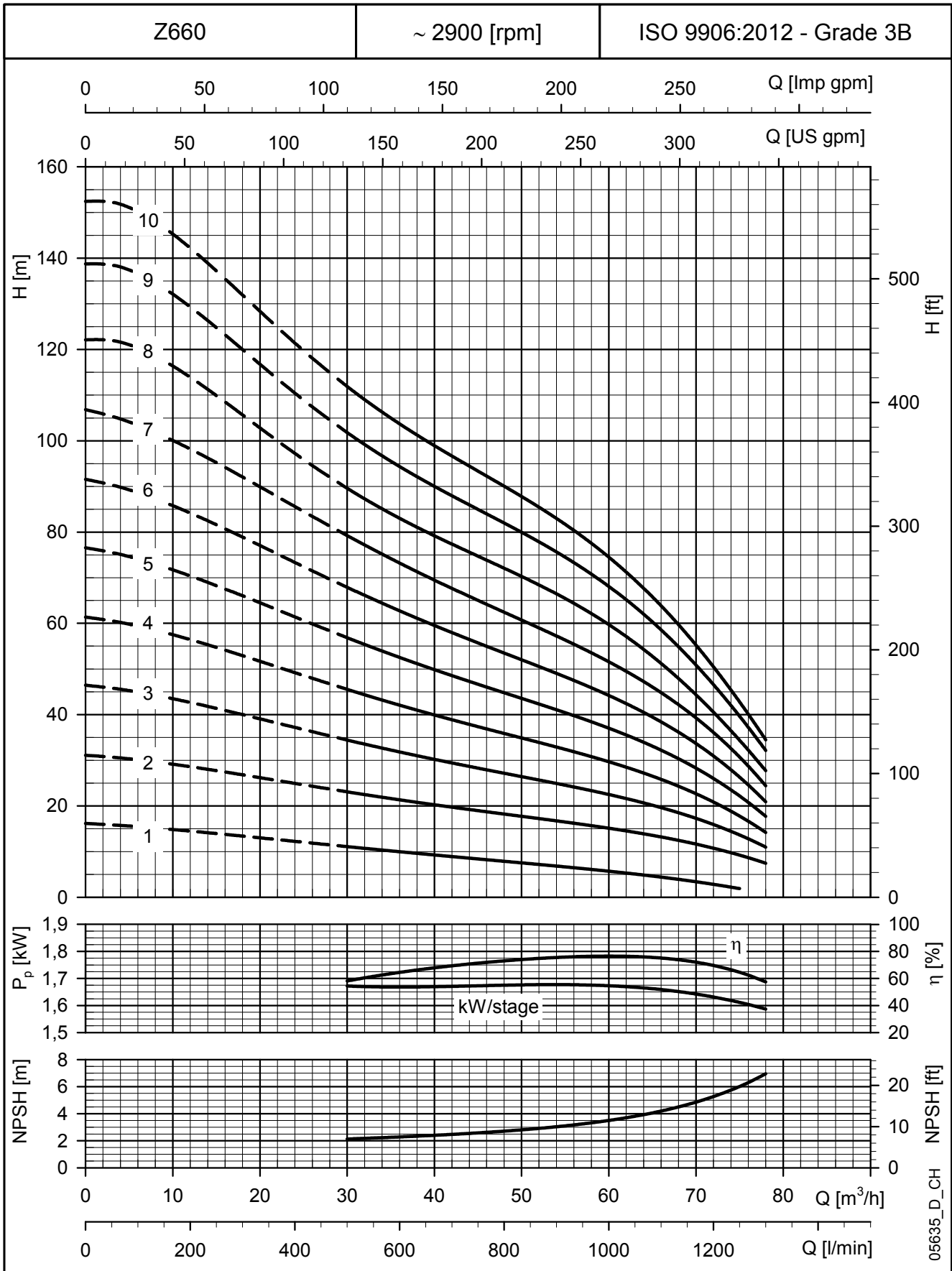


These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .





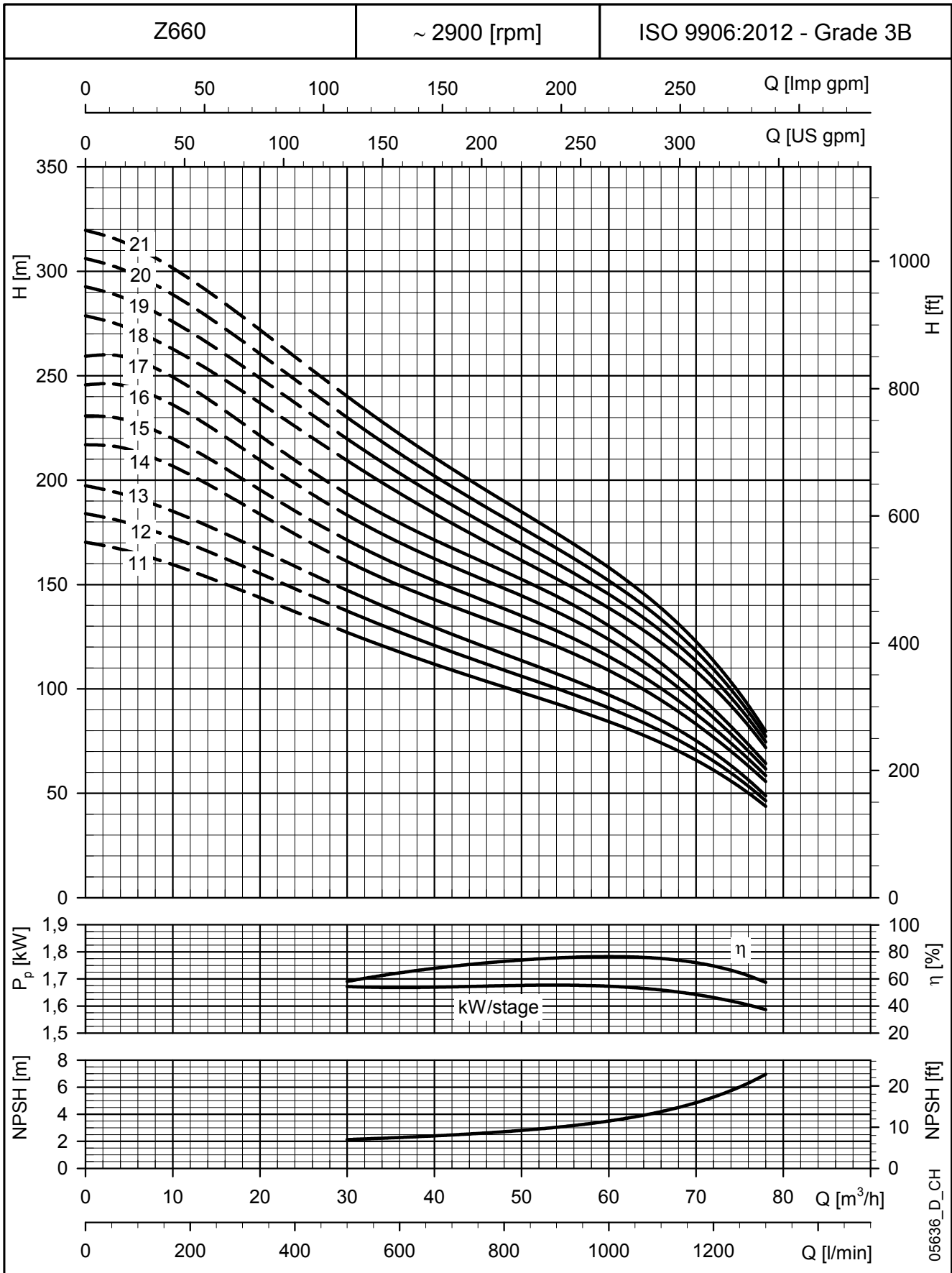
### Z660 SERIES, 1 TO 10 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



### Z660 SERIES, 11 TO 21 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z660 SERIES, 22 TO 32 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS

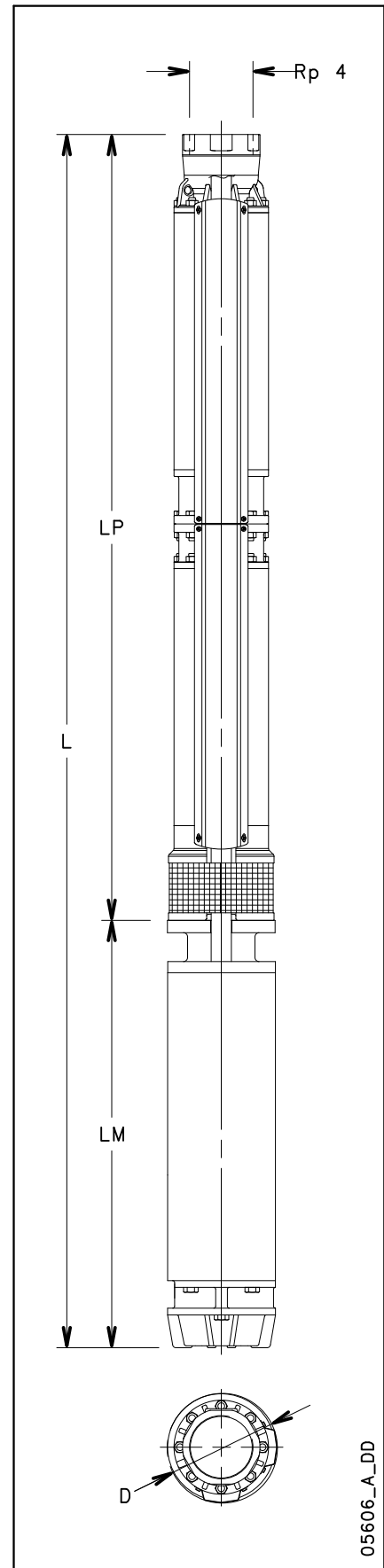
PUMP TYPE	RATED POWER kW	Q = DELIVERY					
		l/min	500	700	900	1100	1300
		0	30	42	54	66	78
		0	30	42	54	66	78
		H = TOTAL HEAD METRES COLUMN OF WATER					
Z660 22D	45	339,5	254,7	218,2	185,8	148,1	86,5
Z660 23D	45	353,5	265,2	227,1	193,3	153,9	89,2
Z660 24D	45	367,3	275,5	235,8	200,6	159,5	91,8
Z660 25D	45	381,0	285,6	244,5	207,9	165,0	94,3
Z660 26D	45	394,6	295,8	253,0	214,9	170,3	96,7
Z660 27D	52	414,4	311,2	266,4	226,7	180,6	104,7
Z660 28D	52	427,9	321,4	275,1	234,0	186,1	107,4
Z660 29D	52	441,7	331,5	283,7	241,1	191,5	109,7
Z660 30D	52	455,0	341,5	292,2	248,2	196,8	112,1
Z660 31D	55	474,8	356,5	305,1	259,5	206,5	119,4
Z660 32D	55	488,4	366,6	313,9	266,9	212,0	121,8

\* Efficiency index MEI

z660-3-50-en\_b\_th

## ELECTROPUMPS DIMENSIONS AND WEIGHTS

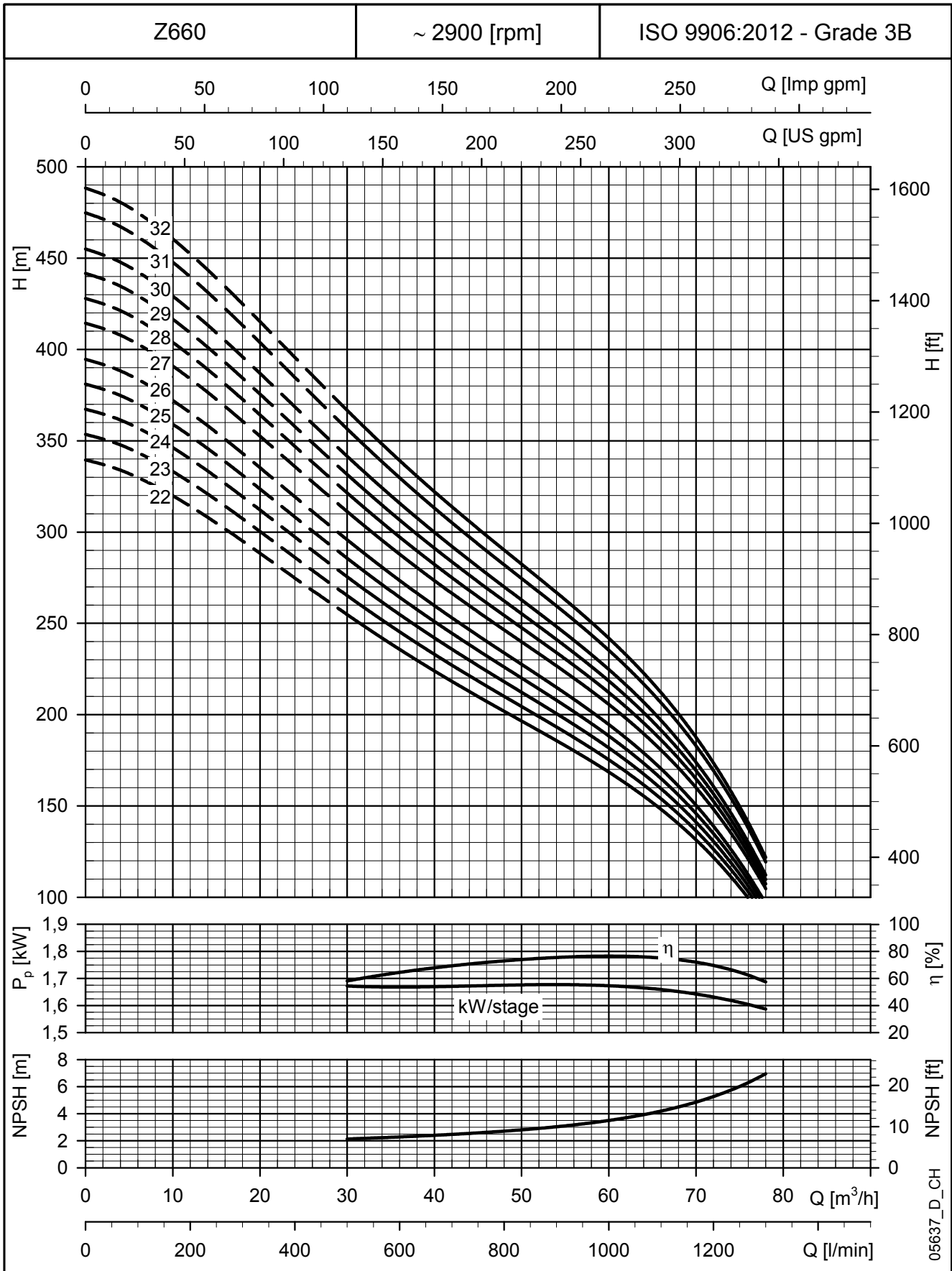
ELECTRO PUMP TYPE	RATED POWER kW	DIMENSIONS (mm)					WEIGHT Kg
		L	LM	LP	ø D		
					1 Cable	2 Cables	
Z660 22D-L8W	45	4520	1135	3385	193	195	308
Z660 23D-L8W	45	4520	1135	3385	193	195	309
Z660 24D-L8W	45	4520	1135	3385	193	195	310
Z660 25D-L8W	45	4865	1135	3730	193	195	319
Z660 26D-L8W	45	4865	1135	3730	193	195	320
Z660 27D-L8W	52	4945	1215	3730	193	195	342
Z660 28D-L8W	52	5290	1215	4075	193	195	352
Z660 29D-L8W	52	5290	1215	4075	193	195	353
Z660 30D-L8W	52	5290	1215	4075	193	195	355
Z660 31D-L8W	55	5435	1245	4190	193	195	363
Z660 32D-L8W	55	5780	1245	4535	193	195	373



05606\_A\_DD

z660-3-50-en\_b\_td

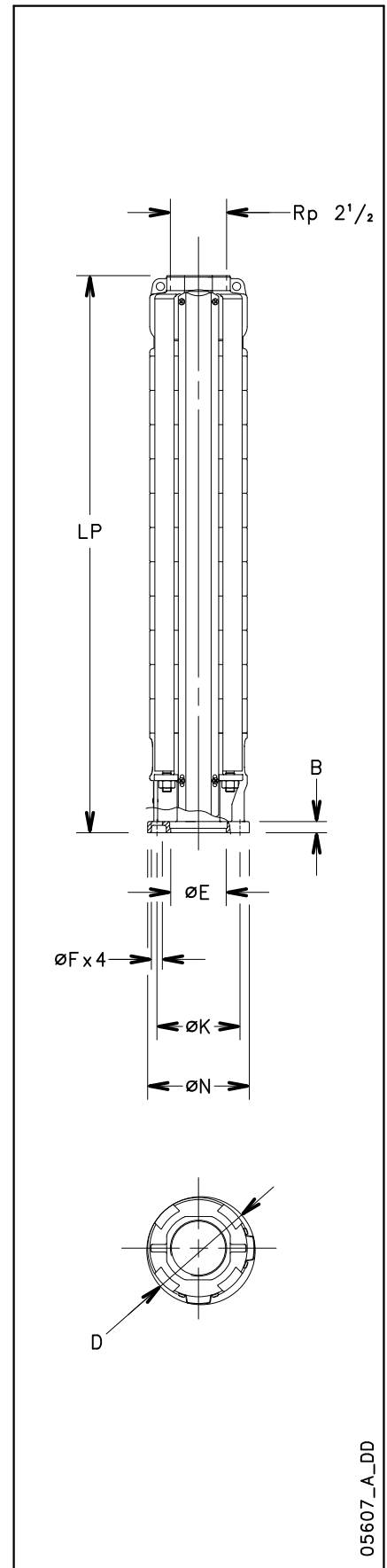
### Z660 SERIES, 22 TO 32 STAGES ELECTROPUMPS OPERATING CHARACTERISTICS



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z612 PUMP SERIES, 1 TO 39 STAGES PUMPS DIMENSIONS AND WEIGHTS

PUMP TYPE	MAX PUMP POWER at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg
		LP	ø D		
			1 Cable	2 Cables	
Z612 01-4	0,5	380	142	144	9
Z612 02-4	1,0	426	142	144	10
Z612 03-4	1,4	472	142	144	12
Z612 04-4	1,9	518	142	144	13
Z612 05-4	2,4	564	142	144	14
Z612 06-4	2,9	610	142	144	15
Z612 07-4	3,4	656	142	144	16
Z612 08-4	3,9	702	142	144	17
Z612 09-4	4,4	748	142	144	19
Z612 10-4	4,8	794	142	144	20
Z612 11-4	5,3	840	142	144	21
Z612 12-4	5,8	886	142	144	22
Z612 13-4	6,3	932	142	144	23
Z612 14-4	6,7	978	142	144	24
Z612 15-4	7,2	1024	142	144	26
Z612 07-6	3,4	656	142	144	16
Z612 08-6	3,9	702	142	144	17
Z612 09-6	4,4	748	142	144	19
Z612 10-6	4,8	794	142	144	20
Z612 11-6	5,3	840	142	144	21
Z612 12-6	5,8	886	142	144	22
Z612 13-6	6,3	932	142	144	23
Z612 14-6	6,7	978	142	144	24
Z612 15-6	7,2	1024	142	144	26
Z612 16-6	7,7	1070	142	144	27
Z612 17-6	8,2	1116	142	144	28
Z612 18-6	8,7	1162	142	144	29
Z612 19-6	9,1	1208	142	144	30
Z612 20-6	9,6	1254	142	144	32
Z612 21-6	10,1	1300	142	144	33
Z612 22-6	10,6	1346	142	144	34
Z612 23-6	11,1	1438	142	144	36
Z612 24-6	11,5	1484	142	144	37
Z612 25-6	11,9	1530	142	144	38
Z612 26-6	12,4	1576	142	144	40
Z612 27-6	12,9	1622	142	144	41
Z612 28-6	13,4	1668	142	144	42
Z612 29-6	13,9	1714	142	144	43
Z612 30-6	14,3	1760	142	144	44
Z612 31-6	14,8	1806	142	144	46
Z612 32-6	15,3	1852	142	144	47
Z612 33-6	16,0	1898	142	144	48
Z612 34-6	16,3	1944	142	144	49
Z612 35-6	16,8	1990	142	144	50
Z612 36-6	17,3	2082	142	144	52
Z612 37-6	17,8	2128	142	144	54
Z612 38-6	18,2	2174	142	144	55
Z612 39-6	18,7	2220	142	144	56



### PUMPS MOTOR CONNECTION

z612p-2p50-en\_b\_td

MOTOR	DIMENSIONS (mm)				
	N	K	F	B	E <sup>H7</sup>
4" (NEMA)	130	76,2	9,5	10,5	87,3
6" (NEMA)	136	111,1	14,5	15	76,2

Coupling 4" and 6" according to NEMA standards

z6-mtcn-2p50-en\_a\_td

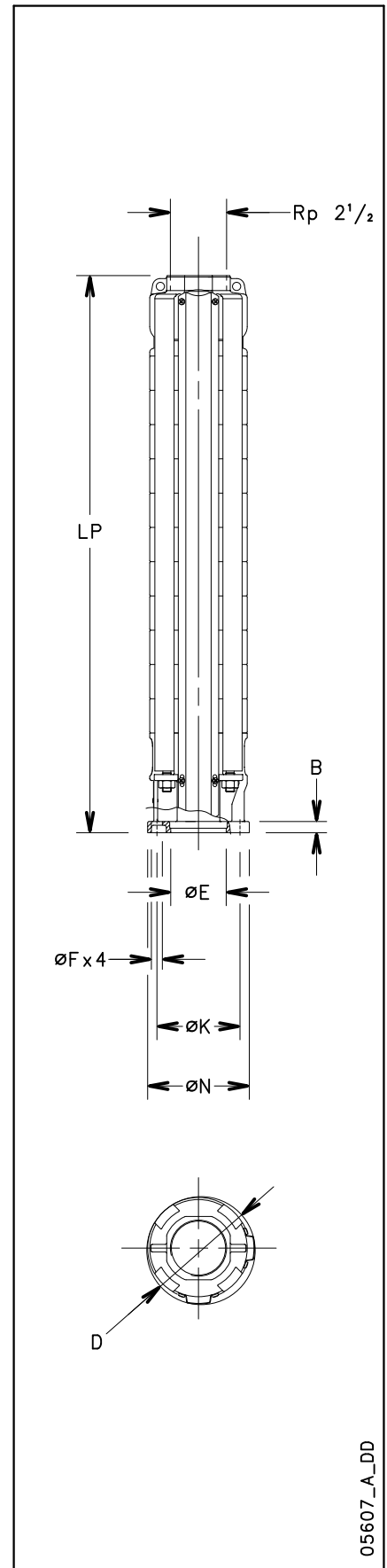
05607\_A\_DD





## Z616 PUMP SERIES, 1 TO 36 STAGES PUMPS DIMENSIONS AND WEIGHTS

PUMP TYPE	MAX PUMP POWER at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg
		LP	ø D		
			1 Cable	2 Cables	
Z616 01-4	0,8	380	142	144	9
Z616 02-4	1,7	426	142	144	10
Z616 03-4	2,5	472	142	144	12
Z616 04-4	3,0	518	142	144	13
Z616 05-4	3,8	564	142	144	14
Z616 06-4	4,5	610	142	144	15
Z616 07-4	5,2	656	142	144	16
Z616 08-4	5,9	702	142	144	17
Z616 09-4	6,6	748	142	144	19
Z616 10-4	7,3	794	142	144	20
Z616 05-6	3,8	564	142	144	14
Z616 06-6	4,5	610	142	144	15
Z616 07-6	5,2	656	142	144	16
Z616 08-6	5,9	702	142	144	17
Z616 09-6	6,6	748	142	144	19
Z616 10-6	7,3	794	142	144	20
Z616 11-6	8,1	840	142	144	21
Z616 12-6	8,6	886	142	144	22
Z616 13-6	9,3	932	142	144	23
Z616 14-6	10,0	978	142	144	24
Z616 15-6	10,8	1024	142	144	26
Z616 16-6	11,5	1070	142	144	27
Z616 17-6	12,3	1116	142	144	28
Z616 18-6	13,1	1162	142	144	29
Z616 19-6	13,8	1208	142	144	30
Z616 20-6	14,3	1254	142	144	32
Z616 21-6	15,0	1300	142	144	33
Z616 22-6	15,7	1346	142	144	34
Z616 23-6	16,4	1438	142	144	36
Z616 24-6	17,1	1484	142	144	37
Z616 25-6	17,9	1530	142	144	38
Z616 26-6	18,6	1576	142	144	40
Z616 27-6	19,3	1622	142	144	41
Z616 28-6	20,0	1668	142	144	42
Z616 29-6	20,7	1714	142	144	43
Z616 30-6	21,4	1760	142	144	44
Z616 31-6	22,1	1806	142	144	46
Z616 32-6	22,8	1852	142	144	47
Z616 33-6	23,5	1898	142	144	48
Z616 34-6	24,2	1944	142	144	49
Z616 35-6	25,0	1990	142	144	50
Z616 36-6	25,7	2082	142	144	52



### PUMPS MOTOR CONNECTION

z616p-2p50-en\_a\_td

MOTOR	DIMENSIONS (mm)				
	N	K	F	B	E <sup>H7</sup>
4" (NEMA)	130	76,2	9,5	10,5	87,3
6" (NEMA)	136	111,1	14,5	15	76,2
Coupling 4" and 6" according to NEMA standards					

z6-mtcn-2p50-en\_a\_td

05607\_A\_DD



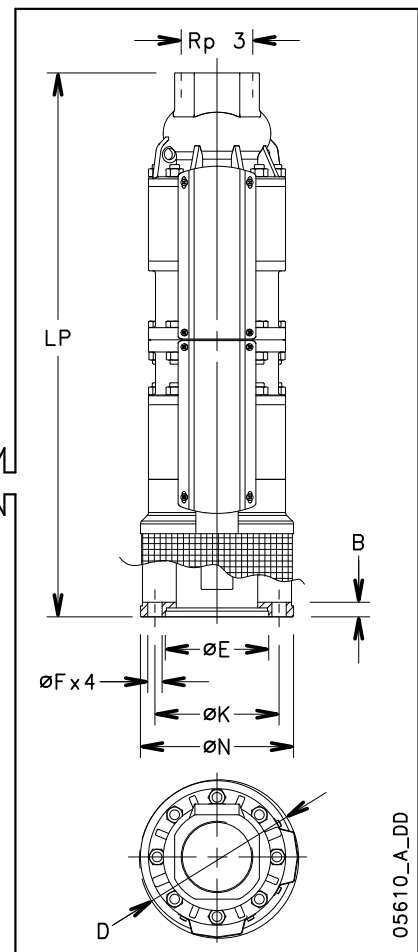
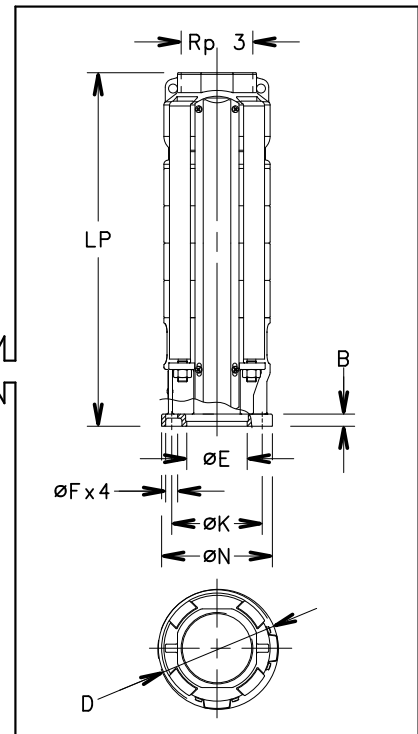




## Z631 PUMP SERIES PUMPS DIMENSIONS AND WEIGHTS

PUMP TYPE	MAX PUMP POWER at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg
		LP	ø D		
			1 Cable	2 Cables	
Z631 01-4	1,3	367	142	144	9
Z631 02-4	2,6	436	142	144	10
Z631 03-4	3,9	505	142	144	12
Z631 04-4	5,2	574	142	144	14
Z631 05-4	6,6	643	142	144	15
Z631 06-4	7,8	712	142	144	17
Z631 03-6	3,9	505	142	144	12
Z631 04-6	5,2	574	142	144	14
Z631 05-6	6,6	643	142	144	15
Z631 06-6	7,8	712	142	144	17
Z631 07-6	9,2	781	142	144	18
Z631 08-6	10,5	850	142	144	20
Z631 09-6	11,7	919	142	144	21
Z631 10-6	13,0	988	142	144	23
Z631 11-6	14,3	1057	142	144	24
Z631 12-6	15,7	1126	142	144	26
Z631 13-6	17,0	1195	142	144	27
Z631 14-6	18,3	1264	142	144	29
Z631 15-6	19,6	1333	142	144	31
Z631 16-6	20,9	1402	142	144	32
Z631 17-6	22,0	1471	142	144	34
Z631 18-6	23,2	1540	142	144	35
Z631 19-6	24,5	1609	142	144	37
Z631 20-6	25,8	1678	142	144	38
Z631 21-6	27,1	1747	142	144	40
Z631 22-6	28,4	1816	142	144	42
Z631 23-6	30,1	1885	142	144	43
Z631 24-6	31,6	1954	142	144	45
Z631 25-6	32,7	2023	142	144	46
Z631 26-6	34,0	2092	142	144	48
Z631 27-6	35,3	2161	142	144	50
Z631 28-6	36,7	2230	142	144	51
Z631 29-6	38,0	2299	142	144	53

Z631 30D-8	39,3	2971	193	195	112
Z631 31D-8	40,6	2971	193	195	113
Z631 32D-8	41,9	2971	193	195	114
Z631 33D-8	43,2	2971	193	195	115
Z631 34D-8	44,5	2971	193	195	115
Z631 35D-8	45,8	3385	193	195	128
Z631 36D-8	47,1	3385	193	195	128
Z631 37D-8	48,4	3385	193	195	129
Z631 38D-8	49,7	3385	193	195	130
Z631 39D-8	51,1	3385	193	195	131
Z631 40D-8	52,4	3385	193	195	131
Z631 41D-8	53,7	3523	193	195	135
Z631 42D-8	55,0	3523	193	195	136
Z631 43D-8	56,3	3661	193	195	141



z631p-2p50-en\_a\_td

05610\_A\_DD

## PUMPS MOTOR CONNECTION

MOTOR	DIMENSIONS (mm)				
	N	K	F	B	E <sup>H7</sup>
4" (NEMA)	130	76,2	9,5	10,5	87,3
6" (NEMA)	136	111,1	14,5	15	76,2
8" (NEMA)	188	152,4	17,5	18	127

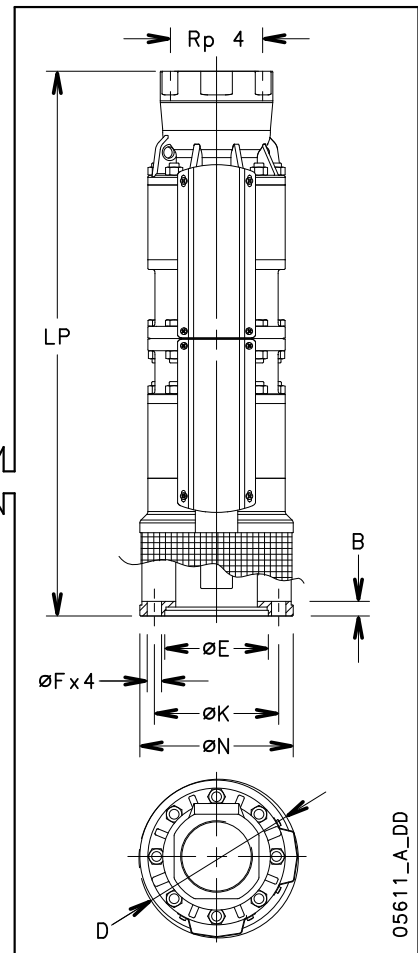
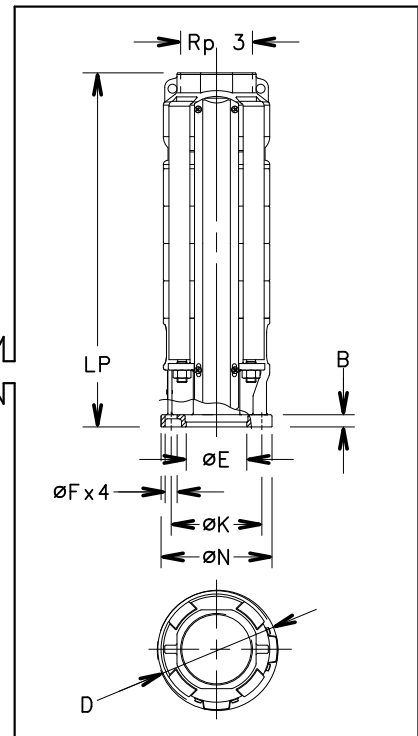
Coupling 4" - 6" and 8" according to NEMA standards

z6c-mtcn-2p50-en\_a\_td

**Z646 PUMP SERIES  
PUMPS DIMENSIONS AND WEIGHTS**

PUMP TYPE	MAX PUMP POWER at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg
		LP	ø D		
			1 Cable	2 Cables	
Z646 01-4	1,5	413	142	144	10
Z646 02-4	3,0	528	142	144	12
Z646 03-4	4,5	643	142	144	15
Z646 04-4	6,0	758	142	144	17
Z646 05-4	7,5	873	142	144	20
Z646 03-6	4,5	643	142	144	15
Z646 04-6	6,0	758	142	144	17
Z646 05-6	7,5	873	142	144	20
Z646 06-6	9,0	988	142	144	22
Z646 07-6	10,5	1103	142	144	25
Z646 08-6	12,0	1218	142	144	27
Z646 09-6	13,5	1333	142	144	30
Z646 10-6	15,0	1448	142	144	32
Z646 11-6	16,5	1563	142	144	35
Z646 12-6	18,0	1678	142	144	37
Z646 13-6	19,5	1793	142	144	40
Z646 14-6	21,0	1908	142	144	42
Z646 15-6	22,5	2023	142	144	45
Z646 16-6	24,1	2138	142	144	47
Z646 17-6	25,6	2253	142	144	50
Z646 18-6	27,1	2368	142	144	52
Z646 19-6	28,6	2483	142	144	55
Z646 20-6	30,1	2598	142	144	57
Z646 21-6	31,6	2713	142	144	60
Z646 22-6	33,1	2828	142	144	62
Z646 23-6	34,6	2943	142	144	65
Z646 24-6	36,1	3058	142	144	67
Z646 25-6	37,6	3173	142	144	70

Z646 26D-8	39,1	3730	193	195	140
Z646 27D-8	40,6	3730	193	195	142
Z646 28D-8	42,1	4075	193	195	152
Z646 29D-8	43,6	4075	193	195	153
Z646 30D-8	45,1	4075	193	195	155
Z646 31D-8	46,6	4190	193	195	157
Z646 32D-8	48,1	4535	193	195	167
Z646 33D-8	49,6	4535	193	195	168
Z646 34D-8	51,1	4535	193	195	170
Z646 35D-8	52,6	4995	193	195	183
Z646 36D-8	54,1	4995	193	195	184
Z646 37D-8	55,6	4995	193	195	186



z646p-2p50-en\_a\_td

05611\_A\_DD

**PUMPS MOTOR CONNECTION**

MOTOR	DIMENSIONS (mm)				
	N	K	F	B	E <sup>H7</sup>
4" (NEMA)	130	76,2	9,5	10,5	87,3
6" (NEMA)	136	111,1	14,5	15	76,2
8" (NEMA)	188	152,4	17,5	18	127

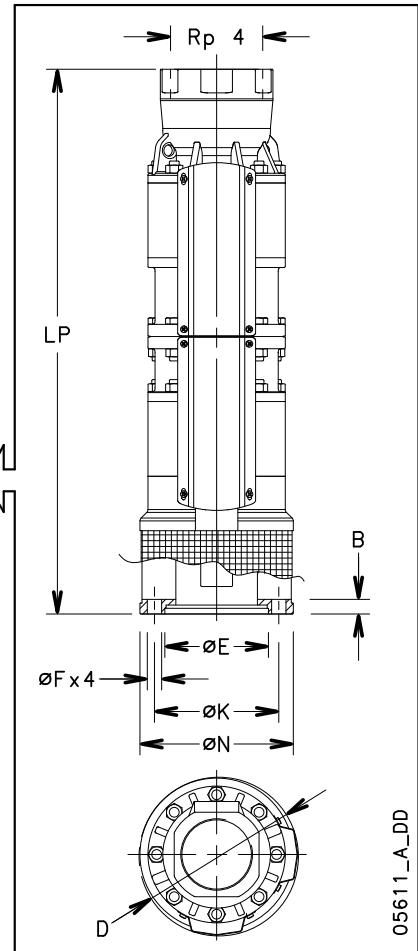
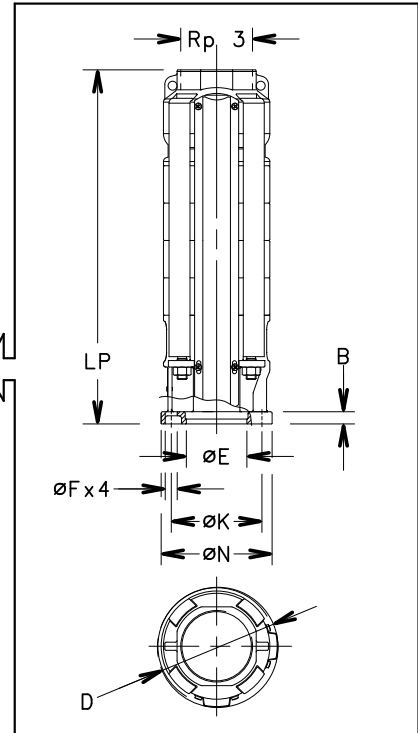
Coupling 4" - 6" and 8" according to NEMA standards

z6c-mtcn-2p50-en\_a\_td

## Z660 PUMP SERIES PUMPS DIMENSIONS AND WEIGHTS

PUMP TYPE	MAX PUMP POWER at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg
		LP	ø D		
			1 Cable	2 Cables	
Z660 01-4	1,8	413	142	144	10
Z660 02-4	3,5	528	142	144	12
Z660 03-4	5,3	643	142	144	15
Z660 04-4	7,1	758	142	144	17
Z660 02-6	3,5	528	142	144	12
Z660 03-6	5,3	643	142	144	15
Z660 04-6	7,1	758	142	144	17
Z660 05-6	8,8	873	142	144	20
Z660 06-6	10,6	988	142	144	22
Z660 07-6	12,4	1103	142	144	25
Z660 08-6	14,2	1218	142	144	27
Z660 09-6	15,9	1333	142	144	30
Z660 10-6	17,7	1448	142	144	32
Z660 11-6	19,5	1563	142	144	35
Z660 12-6	21,2	1678	142	144	37
Z660 13-6	23,0	1793	142	144	40
Z660 14-6	24,8	1908	142	144	42
Z660 15-6	26,5	2023	142	144	45
Z660 16-6	28,3	2138	142	144	47
Z660 17-6	30,1	2253	142	144	50
Z660 18-6	31,8	2368	142	144	52
Z660 19-6	33,6	2483	142	144	55
Z660 20-6	35,4	2598	142	144	57
Z660 21-6	37,1	2713	142	144	60

Z660 22D-8	38,9	3385	193	195	128
Z660 23D-8	40,7	3385	193	195	129
Z660 24D-8	42,4	3385	193	195	130
Z660 25D-8	44,2	3730	193	195	139
Z660 26D-8	46,0	3730	193	195	140
Z660 27D-8	47,8	3730	193	195	142
Z660 28D-8	49,5	4075	193	195	152
Z660 29D-8	51,3	4075	193	195	153
Z660 30D-8	53,1	4075	193	195	155
Z660 31D-8	54,8	4190	193	195	157
Z660 32D-8	56,6	4535	193	195	167



05611\_A\_DD

## PUMPS MOTOR CONNECTION

z660p-2p50-en\_a\_td

MOTOR	DIMENSIONS (mm)				
	N	K	F	B	E <sup>H7</sup>
4" (NEMA)	130	76,2	9,5	10,5	87,3
6" (NEMA)	136	111,1	14,5	15	76,2
8" (NEMA)	188	152,4	17,5	18	127

Coupling 4" - 6" and 8" according to NEMA standards

z6c-mtcn-2p50-en\_a\_td

# ACCESSORI



## 4OS - L4C SERIES MOTORS MOTOR - CONTROL PANEL COMBINATION TABLE

MOTOR TYPE 4OS - 4" SINGLE-PHASE	RATED POWER		RATED CURRENT 220-240 V	CAPACITOR  μF / 450 V	PANEL TYPE				
	kW	HP			A	QSM...	QPC...	QPCS...	QSC...
	0,37	0,5	3,2	16	...03	...03	...03	...03	...03
0,55	0,75	4,3	20	...05	...05	...05	...05	...05	
0,75	1	5,6	30	...07	...07	...07	...07	...07	
1,1	1,5	7,6	40	...11	...11	...11	...11	...11	
1,5	2	10,5	50	-	...15	...15	...15	...15	
2,2	3	14,4	70	-	...22	...22	...22	...22	
4	5,5	24,9	90	-	-	-	...40	...40	

4OS-2p50-en\_e\_tc

MOTOR TYPE 4OS - 4" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V	PANEL TYPE				
	kW	HP		A	QTD/...	Q3D/...	Q3I/...	Q3A/...
	0,37	0,5	1,2	...03-05	...03-05	-	-	-
0,55	0,75	1,7	...05-07	...05-07	-	-	-	
0,75	1	2,4	...05-07	...05-07	-	-	-	
1,1	1,5	3,1	...07-15	...07-15	-	-	-	
1,5	2	4,4	...15-22	...15-22	-	-	-	
2,2	3	6,1	...15-22	...15-22	-	-	-	
3	4	7,1	...22-40	...22-40	-	-	-	
4	5,5	9,8	...22-40	...22-40	-	-	-	
5,5	7,5	13,7	...40-75	...40-75	...40-75	...40-75	...75	
7,5	10	18,7	...75-92	...75-92	...75-92	...75-92	...150	

For different voltages, please contact our sales network.

4OS-2p50-en\_e\_tc

MOTOR TYPE L4C - 4" SINGLE-PHASE	RATED POWER		RATED CURRENT 220-240 V	CAPACITOR  μF / 450 V	PANEL TYPE				
	kW	HP			A	QSM...	QPC...	QPCS...	QSC...
	0,37	0,5	3,4	16	...03	...03	...03	...03	...03
0,55	0,75	4,8	20	...05	...05	...05	...05	...05	
0,75	1	6,5	30	...07	...07	...07	...07	...07	
1,1	1,5	8,3	40	...11	...11	...11	...11	...11	
1,5	2	10,7	50	-	...15	...15	...15	...15	
2,2	3	15,3	70	-	...22	...22	...22	...22	
4	5,5	29,9	90	-	-	-	...40	...40	

L4c-2p50\_i\_tc

MOTOR TYPE L4C - 4" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V	PANEL TYPE				
	kW	HP		A	QTD/...	Q3D/...	Q3I/...	Q3A/...
	0,37	0,5	1,8	...05-07	...05-07	-	-	-
0,55	0,75	2	...05-07	...05-07	-	-	-	
0,75	1	2,6	...07-15	...07-15	-	-	-	
1,1	1,5	3,6	...07-15	...07-15	-	-	-	
1,5	2	4,6	...15-22	...15-22	-	-	-	
2,2	3	6,2	...15-22	...15-22	-	-	-	
3	4	8,8	...22-40	...22-40	-	-	-	
4	5,5	10,5	...40-75	...40-75	-	-	-	
5,5	7,5	14,5	...40-75	...40-75	...40-75	...40-75	...75	
7,5	10	18,1	...75-92	...75-92	...75-92	...75-92	...150	

For different voltages please contact our sales network

L4c-2p50\_i\_tc

## L6C - L6W SERIES MOTORS MOTOR - CONTROL PANEL COMBINATION TABLE

MOTOR TYPE L6C - 6" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		QTD/...	Q3D/...	Q3I/...	Q3A/...	Q3Y/...	Q3SF/...
	4	5,5		11,0	...40-75	...40-75	...40-75	...40-75	...40-75
5,5	7,5	14,6	...40-75	...40-75	...40-75	...40-75	...40-75	...75	
7,5	10	18,3	...75-92	...75-92	...75-92	...75-92	...75-92	...150	
9,3	12,5	22,8	-	...92-110	...92-110	...92-110	...92-110	...150	
11	15	26,0	-	...110-150	...110-150	...110-150	...110-150	...150	
15	20	34,2	-	...150-185	...150-185	...150-185	...150-185	...220	
18,5	25	42,0	-	...185-220	...185-220	...185-220	...185-220	...220	
22	30	47,5	-	...185-220	...185-220	...185-220	...185-220	...300	
30	40	63,5	-	...300-370	...300-370	...300-370	...300-370	...370	
37	50	80,0	-	-	...370-450	...370-450	...370-450	...450	

For different voltages, please contact our sales network.

L6c-2p50-en\_e\_tc

MOTOR TYPE L6W - 6" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		QTD/...	Q3D/...	Q3I/...	Q3A/...	Q3Y/...	Q3SF/...
	4	5,5		9,89	...40-75	...40-75	...40-75	...40-75	...40-75
5,5	7,5	12,7	...40-75	...40-75	...40-75	...40-75	...40-75	...75	
7,5	10	17,0	...75-92	...75-92	...75-92	...75-92	...75-92	...150	
9,3	12,5	20,5	-	...92-110	...92-110	...92-110	...92-110	...150	
11	15	24,2	-	...110-150	...110-150	...110-150	...110-150	...150	
13	17,5	28,1	-	...110-150	...110-150	...110-150	...110-150	...150	
15	20	32,1	-	...150-185	...150-185	...150-185	...150-185	...220	
18,5	25	38,5	-	...185-220	...185-220	...185-220	...185-220	...220	
22	30	47,3	-	...220-300	...220-300	...220-300	...220-300	...300	
26	35	56,5	-	...220-300	...220-300	...220-300	...220-300	...300	
30	40	63,8	-	...300-370	...300-370	...300-370	...300-370	...370	
37	50	81,8	-	-	...370-450	...370-450	...370-450	...450	
MOTOR TYPE L6W HT - 6" THREE-PHASE	4	5,5	10,5	...40-75	...40-75	...40-75	...40-75	...40-75	...75
	5,5	7,5	13,4	...40-75	...40-75	...40-75	...40-75	...40-75	...75
	7,5	10	17,3	...75-92	...75-92	...75-92	...75-92	...75-92	...150
	9,3	12,5	20,8	-	...92-110	...92-110	...92-110	...92-110	...150
	11	15	23,9	-	...110-150	...110-150	...110-150	...110-150	...150
	13	17,5	28,4	-	...110-150	...110-150	...110-150	...110-150	...150
	15	20	32,5	-	...150-185	...150-185	...150-185	...150-185	...220
	18,5	25	41,6	-	...185-220	...185-220	...185-220	...185-220	...220
	22	30	49,7	-	...220-300	...220-300	...220-300	...220-300	...300
	26	35	55,8	-	...220-300	...220-300	...220-300	...220-300	...300
30	40	68,8	-	...300-370	...300-370	...300-370	...300-370	...370	

For different voltages, please contact our sales network.

L6w-2p50-en\_c\_tc

## L8W SERIES MOTORS MOTOR - CONTROL PANEL COMBINATION TABLE

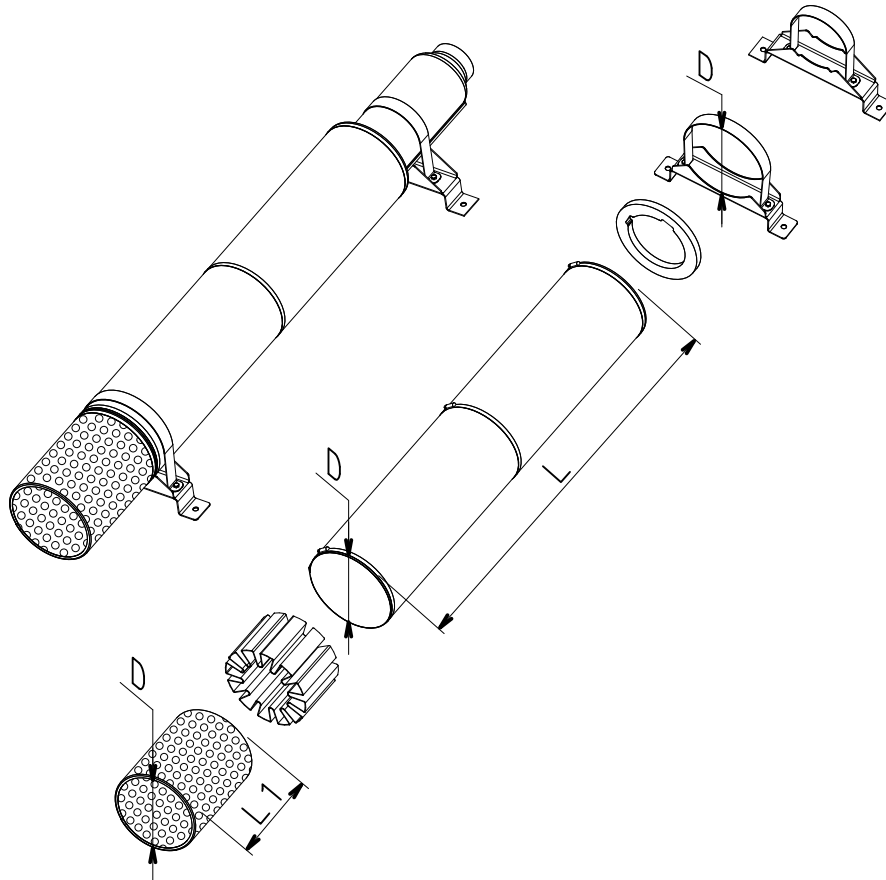
MOTOR TYPE L8W - 8" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		Q3D/...	Q3I/...	Q3A/...	Q3SF/...		
	30	40	64,5	...300-370	...300-370	...300-370	...370		
	37	50	80	-	...370-450	...370-450	...450		
	45	60	95,9	-	...450-550	...450-550	...550		
	52	70	110	-	...550-750	...550-750	...590		
	55	75	118	-	...550-750	...550-750	...590		
	60	80	127	-	...550-750	...550-750	...750		
	67	90	140	-	...750-900	...750-900	...900		
	75	100	155	-	...750-900	...750-900	...900		
	83	110	171	-	...750-900	...750-900	...900		
	93	125	189	-	...900-1100	...900-1100	...1100		
MOTOR TYPE L8W HT - 8" THREE-PHASE	30	40	63,7	...300-370	...300-370	...300-370	...370		
	37	50	77	-	...370-450	...370-450	...450		
	45	60	94,7	-	...450-550	...450-550	...550		
	52	70	111	-	...550-750	...550-750	...590		
	55	75	116	-	...550-750	...550-750	...590		
	60	80	125	-	...550-750	...550-750	...750		
	67	90	137	-	...750-900	...750-900	...900		
	75	100	153	-	...750-900	...750-900	...900		
	83	110	168	-	...750-900	...750-900	...900		

For different voltages, please contact our sales network.

L8w-2p50-en\_d\_tc

## COOLING SHROUDS

01890\_B\_DD

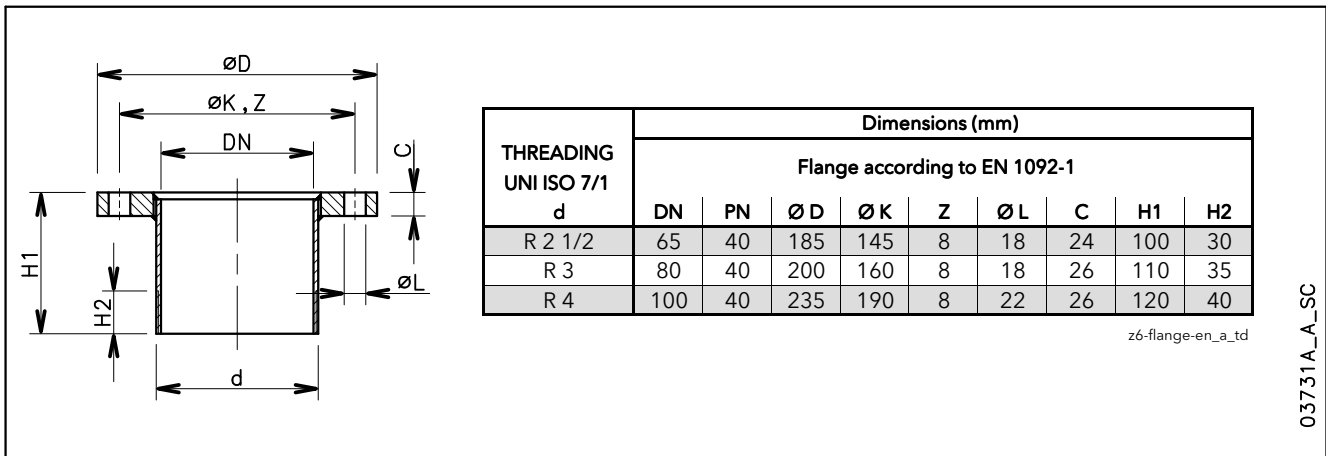


PUMP TYPE	MOTOR TYPE				COOLING SET SHROUD (D x L)	COOLING SET FILTER (D x L1)	COOLING SET BRACKETS (D)	
	40S/B	L4C	L6C	L6W				
Z612 Z616 Z622 Z631 Z646	0,55	0,55			D160X800	D160X158	D160 - 2pcs	
	0,75	0,75						
	1,1	1,1						
	1,5	1,5						
	2,2	2,2						
	3	3						
Z660	4	4			D160X1000	D160X158	D160 - 2pcs	
	5,5	5,5						
	7,5	7,5						
Z612 Z616 Z622 Z631 Z646			3	3	D180X1000	D180X192	D180 - 2pcs	
			4	4				
			5,5	5,5				
			7,5	7,5				
			9,3	9,3				
			11	11				
			-	13				
	Z660			15	15	D180X1500	D180X192	D180 - 3pcs
				18,5	18,5			
				22	22			
				-	26			
				30	30			
				37	37			
				4	4			
Z660			5,5	5,5	D200X1000	D200X192	D200 - 2pcs	
			7,5	7,5				
			9,3	9,3				
			11	11				
			-	13				
			15	15	D200X1500	D200X192	D200 - 3pcs	
			18,5	18,5				
			22	22				
			-	26				
			30	30				
		37	37					

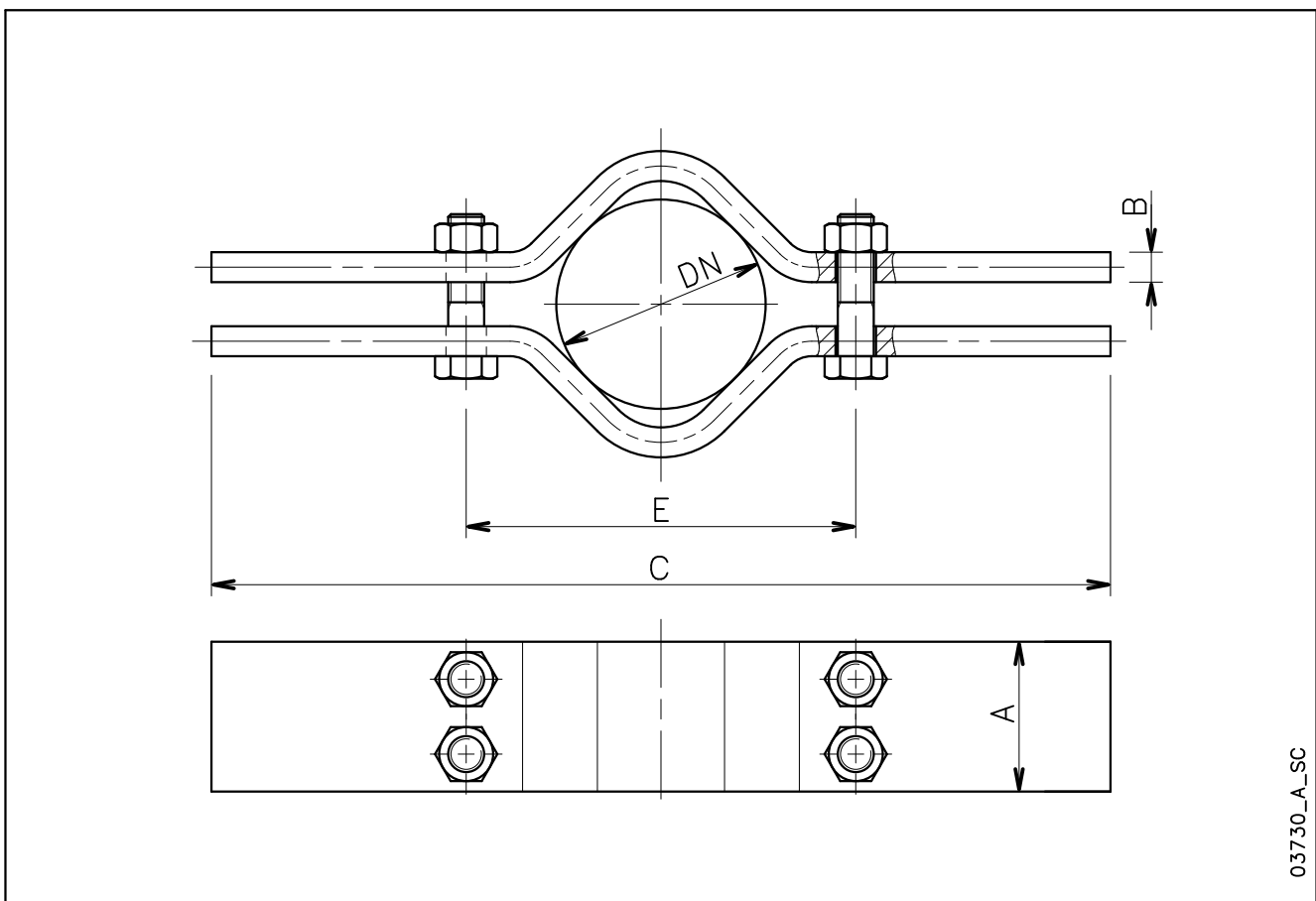
Note: Not available for high pressure version.

z6\_kit-raf50-en\_b\_ta

## THREADED FLANGES ISO



## CARRYING CLAMPS



Ø PIPE NOMINAL DN		CARRYNG CLAMPS						PIPE WEIGHT		
		Dimensions (mm)					Pmax <sup>(1)</sup> kg	Flanged kg/m	Threaded kg/m	Water kg/m
		A	B	C	E	SCREW				
65	R 2 1/2	50	15	600	130	M16x90	1300	6,7	8,0	3,3
80	R 3	80	15	600	180	M20x70	3400	8,4	10,5	5,0
100	R 4	80	15	600	180	M20x110	3400	20,5	15,0	7,9

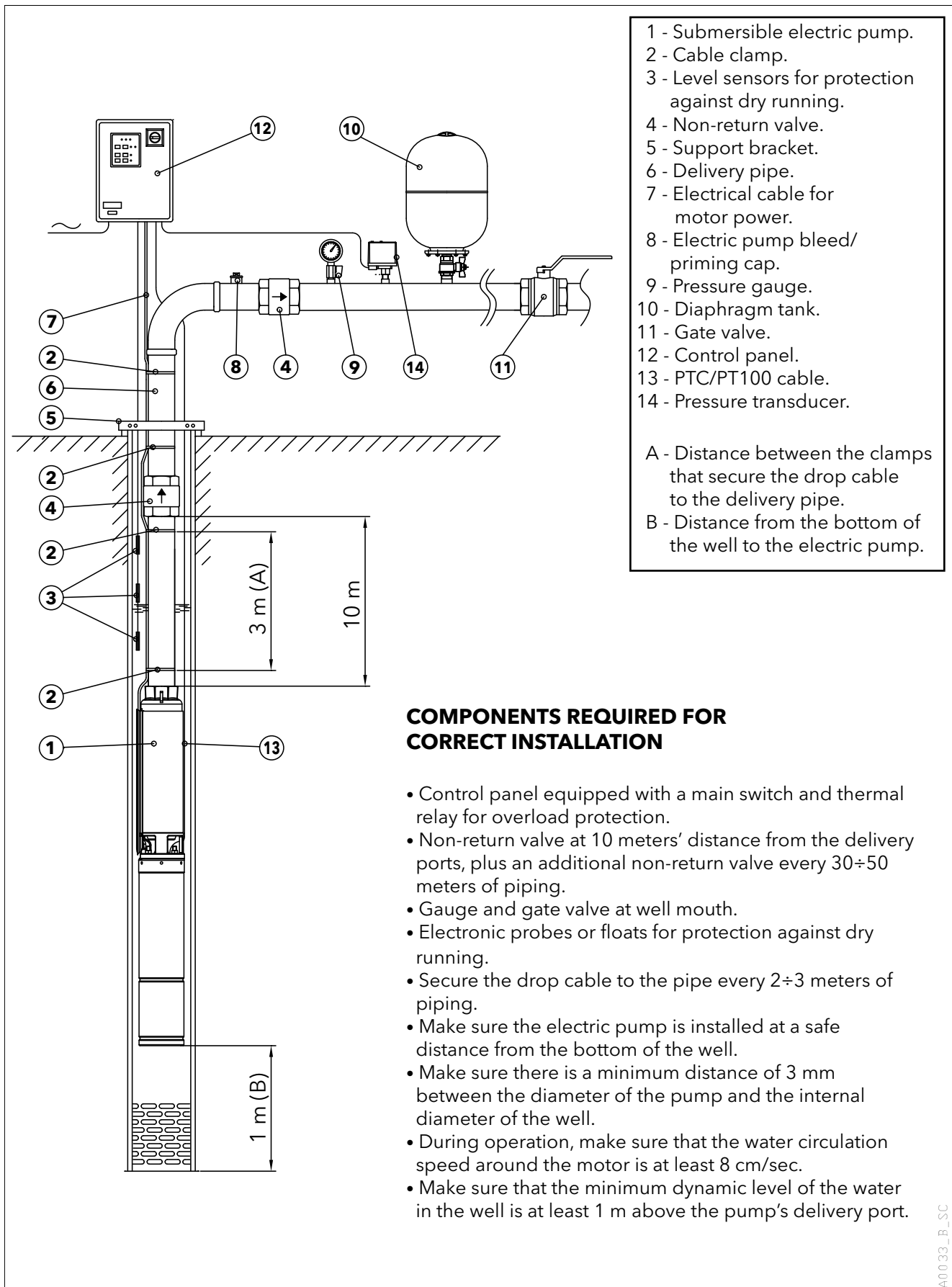
1) Max weight allowable.

z6-clamp-en\_a\_td



# TECHNICAL APPENDIX

## SUBMERSIBLE ELECTRIC PUMP INSTALLATION DIAGRAM



- 1 - Submersible electric pump.
- 2 - Cable clamp.
- 3 - Level sensors for protection against dry running.
- 4 - Non-return valve.
- 5 - Support bracket.
- 6 - Delivery pipe.
- 7 - Electrical cable for motor power.
- 8 - Electric pump bleed/priming cap.
- 9 - Pressure gauge.
- 10 - Diaphragm tank.
- 11 - Gate valve.
- 12 - Control panel.
- 13 - PTC/PT100 cable.
- 14 - Pressure transducer.

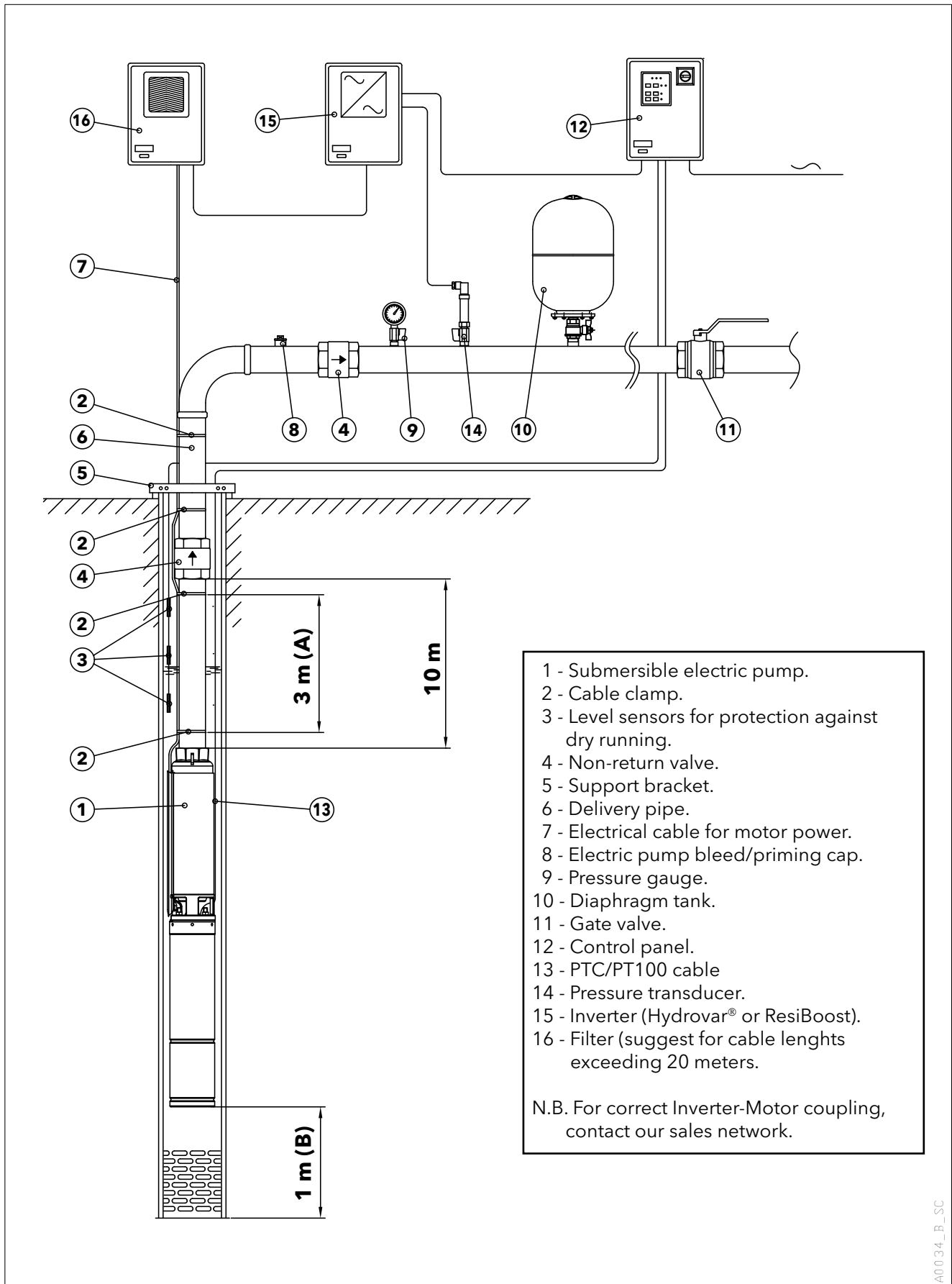
A - Distance between the clamps that secure the drop cable to the delivery pipe.  
B - Distance from the bottom of the well to the electric pump.

### COMPONENTS REQUIRED FOR CORRECT INSTALLATION

- Control panel equipped with a main switch and thermal relay for overload protection.
- Non-return valve at 10 meters' distance from the delivery ports, plus an additional non-return valve every 30÷50 meters of piping.
- Gauge and gate valve at well mouth.
- Electronic probes or floats for protection against dry running.
- Secure the drop cable to the pipe every 2÷3 meters of piping.
- Make sure the electric pump is installed at a safe distance from the bottom of the well.
- Make sure there is a minimum distance of 3 mm between the diameter of the pump and the internal diameter of the well.
- During operation, make sure that the water circulation speed around the motor is at least 8 cm/sec.
- Make sure that the minimum dynamic level of the water in the well is at least 1 m above the pump's delivery port.



## EXAMPLE OF INSTALLATION OF A SUBMERSIBLE ELECTRIC PUMP CONTROLLED BY AN INVERTER



## 4OS - L4C - L6C - L6W - L8W - L10W - L12W MOTOR SERIES

### TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C							
		25	30	35	40	45	50	55	60
4OS	all models	1,00	1,00	1,00	0,90	0,80	0,70	0,60	-
L4C		1,00	1,00	1,00	0,95	0,90	0,85	0,80	-
L6C		1,00	1,00	1,00	0,95	0,80	0,75	0,70	0,60
L6W		1,00	1,00	0,75	-	-	-	-	-
L8W		1,00	1,00	0,75	-	-	-	-	-
L10W		1,00	1,00	0,75	-	-	-	-	-
L12W		1,00	1,00	0,75	-	-	-	-	-
L6W..HT		1,00	1,00	1,00	1,00	1,00	0,85	0,75	0,65
L8W..HT		1,00	1,00	1,00	1,00	1,00	0,85	0,75	0,65
L10W..HT		1,00	1,00	1,00	1,00	1,00	0,85	0,75	0,65
L12W..HT		1,00	1,00	1,00	1,00	1,00	0,85	0,75	0,65

4OS-LC-LW-derating-en\_b\_te

#### EXAMPLE 1

A 2,2 kW 4OS motor is to be used in 50°C water.  
 Motor power at 50 °C = 2,2 x 0,7 = 1,54 kW

#### EXAMPLE 2

A 2,2 kW L4C motor is to be used in 50°C water.  
 Motor power at 50 °C = 2,2 x 0,85 = 1,87 kW

#### EXAMPLE 3

A 7,5 kW L6C motor is to be used in 45°C water.  
 Motor power at 50 °C = 7,5 x 0,8 = 6 kW

#### EXAMPLE 4

A 15 kW L6W motor is to be used in 35°C water.  
 Motor power at 35 °C = 15 x 0,75 = 11,25 kW

## SELECTING CABLE CROSS-SECTIONS FOR SUBMERSIBLE MOTORS

To select the cross-section of power cables for submersible pumps, consult the tables shown below. In these tables, the maximum lengths of the power cable for each cross-section are shown for each motor and next to the various input voltage ratings.

Therefore, to find the required cable cross-section, simply read off the maximum permitted lengths for each cross-section next to the selected motor and required input voltage.

E.g.:

A 120 m long power cable must be matched with a 230V L4C07M235 motor.

To determine the cross-section of the cable, simply move along the row of the 230V motor until you find the maximum length of 120 m or immediately above it and then read off the corresponding cross-section in that column.

In this case, the 4 mm<sup>2</sup> cable is selected.

N.B.: the tables include specific data (current and power factor) for each motor and voltage rating based on a maximum voltage drop of 4% (HD 384.5), a maximum cable temperature of 90°C, water installation similar to air installation at a temperature of 30°C.

## CABLE TYPES

SECTION mm <sup>2</sup>	THREE CORE FLAT					FOUR CORE FLAT					SINGLE CORE ROUND			FOUR CORE ROUND		
	Hmin mm	Lmin mm	Hmax mm	Lmax mm	Weight kg/km	Hmin mm	Lmin mm	Hmax mm	Lmax mm	Weight kg/km	Dmin mm	Dmax mm	Weight kg/km	Dmin mm	Dmax mm	Weight kg/km
4	8	19,2	9	20,8	250	8	25,2	9	26,8	395	6,5	7,5	92	14	16,1	360
6	8	19,2	9	20,8	325	8	25,2	9	26,8	470	7,4	8	118	15,7	18	475
10	8	19,2	9	20,8	535	8	25,2	9	26,8	710	8,6	10	183	20,9	23,9	836
16	-	-	-	-	-	-	-	-	-	-	9,6	11	251	23,8	27,1	1145
25	-	-	-	-	-	-	-	-	-	-	11	13	362	28,9	32,9	1716
35	-	-	-	-	-	-	-	-	-	-	12,5	14,5	497	-	-	-
50	-	-	-	-	-	-	-	-	-	-	15	17	669	-	-	-
70	-	-	-	-	-	-	-	-	-	-	17,5	19,5	901	-	-	-
95	-	-	-	-	-	-	-	-	-	-	20,5	22,5	1141	-	-	-
120	-	-	-	-	-	-	-	-	-	-	22	24,4	1435	-	-	-
150	-	-	-	-	-	-	-	-	-	-	25,2	28,3	1795	-	-	-
185	-	-	-	-	-	-	-	-	-	-	27,6	31	2156	-	-	-
240	-	-	-	-	-	-	-	-	-	-	30,6	34,5	2760	-	-	-

L-cavi-en\_a\_td

### 4OS SINGLE-PHASE, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES, DOL (DIRECT ON LINE) STARTING

MOTOR TYPE SINGLE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>												
							mm <sup>2</sup>	1,5	2,5	4	6	10	16	25	35				
							A max	23	32	42	54	75	100	127	158				
Maximum lenght in metres																			
4OS03M235	0,37	0,5	220	0,98	3,01	4													
			230	0,96	3,06			107	179	288	432								
			240	0,93	3,16														
4OS05M235	0,55	0,75	220	0,98	4,07														
			230	0,96	4,13			79	132	213	319								
			240	0,92	4,25														
4OS07M235	0,75	1	220	0,99	5,44														
			230	0,97	5,45			58	98	158	237	409							
			240	0,94	5,58														
4OS11M235	1,1	1,5	220	0,99	7,45														
			230	0,98	7,37			42	71	115	172	298	469						
			240	0,95	7,55														
4OS15M235	1,5	2	220	0,98	10,0														
			230	0,96	10,1		31	53	86	129	223	351	542						
			240	0,92	10,5														
4OS22M235	2,2	3	220	0,99	14,3														
			230	0,97	14,1		20	36	58	89	154	244	377	528					
			240	0,94	14,4														
4OS40M235	4	5,5	220	0,96	25,7														
			230	0,94	24,9		-	18	31	49	86	137	212	296					
			240	0,92	24,8														

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

4osm-b-cavi-50-en\_e\_te

### 4OS THREE-PHASE, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES, DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>															
	Kw	HP					mm <sup>2</sup>	1,5	2,5	4	6	10	16	25	35							
							A max	23	32	42	54	75	100	127	158							
Maximum length in metres																						
4OS03T235	0,37	0,5	220	0,78	2,04	4																
			230	0,72	2,08			229	381													
			240	0,68	2,15																	
4OS05T235	0,55	0,75	220	0,80	2,79	4																
			230	0,75	2,86			163	271													
			240	0,71	2,96																	
4OS07T235	0,75	1	220	0,78	3,76	4																
			230	0,71	3,95			124	206	331												
			240	0,67	4,16																	
4OS11T235	1,1	1,5	220	0,80	5,06	4																
			230	0,74	5,18			89	149	240	358											
			240	0,70	5,42																	
4OS15T235	1,5	2	220	0,78	6,95	4																
			230	0,72	7,24			66	110	178	266	455										
			240	0,68	7,64																	
4OS22T235	2,2	3	220	0,80	9,72	4																
			230	0,74	10,0			45	76	123	185	317										
			240	0,69	10,5																	
4OS30T235	3	4	220	0,85	12,1	4																
			230	0,81	12,0			33	57	93	140	241	376									
			240	0,77	12,3																	
4OS40T235	4	5,5	220	0,85	16,4	4																
			230	0,80	16,5			23	41	67	102	177	277									
			240	0,76	17,0																	
4OS55T235	5,5	7,5	220	0,83	22,9	4																
			230	0,78	23,0			-	28	48	73	128	201	306								
			240	0,73	23,7																	
4OS75T235	7,5	10	220	0,82	31,0	4																
			230	0,76	31,4			-	19	34	53	94	148	227	314							
			240	0,71	32,4																	
4OS03T405	0,37	0,5	380	0,78	1,18	4																
			400	0,72	1,20			685														
			415	0,68	1,24																	
4OS05T405	0,55	0,75	380	0,80	1,61	4																
			400	0,75	1,65			489														
			415	0,71	1,71																	
4OS07T405	0,75	1	380	0,78	2,20	4																
			400	0,71	2,30			367														
			415	0,67	2,40																	
4OS11T405	1,1	1,5	380	0,80	2,90	4																
			400	0,74	3,00			271	451													
			415	0,70	3,10																	
4OS15T405	1,5	2	380	0,78	4,00	4																
			400	0,72	4,20			201	334													
			415	0,68	4,40																	
4OS22T405	2,2	3	380	0,80	5,60	4																
			400	0,74	5,80			139	232	374												
			415	0,69	6,10																	
4OS30T405	3	4	380	0,85	7,00	4																
			400	0,81	7,00			104	174	281	421											
			415	0,77	7,10																	
4OS40T405	4	5,5	380	0,85	9,50	4																
			400	0,80	9,50			75	127	206	309											
			415	0,76	9,80																	
4OS55T405	5,5	7,5	380	0,83	13,2	4																
			400	0,78	13,3			53	92	150	226	389										
			415	0,73	13,7																	
4OS75T405	7,5	10	380	0,82	17,9	4																
			400	0,76	18,1			37	66	109	166	288	451									
			415	0,71	18,7																	

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

4os-b-cavi-50-en\_b\_te

### L4C SINGLE-PHASE, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES, DOL (DIRECT ON LINE) STARTING

MOTOR TYPE SINGLE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>												
	Kw	HP					mm <sup>2</sup>	1,5	2,5	4	6	10	16	25	35				
							A max	23	32	42	54	75	100	127	158				
L4C03M235	0,37	0,5	220	0,96	3,20	4													
			230	0,97	3,30			103	172	278	416								
			240	0,91	3,40														
L4C05M235	0,55	0,75	220	0,95	4,30														
			230	0,94	4,60			76	127	205	307								
			240	0,90	4,80														
L4C07M235	0,75	1	220	0,93	6,00														
			230	0,92	6,20			57	96	155	232	398							
			240	0,85	6,50														
L4C11M235	1,1	1,5	220	0,94	8,10														
			230	0,92	8,10			40	68	110	166	286	448						
			240	0,87	8,30														
L4C15M235	1,5	2	220	0,96	10,4														
			230	0,93	10,4		30	52	84	126	218	343	527						
			240	0,90	10,7														
L4C22M235	2,2	3	220	0,96	15,4														
			230	0,94	15,0		19	34	56	84	146	231	355	496					
			240	0,91	15,3														
L4C40M235	4	5,5	220	0,93	29,9														
			230	0,90	29,8		-	15	27	42	75	120	185	259					
			240	0,87	29,7														

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l4cm-cavi-50-en\_d\_te

## L4C THREE-PHASE, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES, DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>															
	Kw	HP					mm <sup>2</sup>	1,5	2,5	4	6	10	16	25	35							
							A max	23	32	42	54	75	100	127	158							
Maximum length in metres																						
L4C03T235	0,37	0,5	220	0,69	2,60	4																
			230	0,70	2,70			190	316													
			240	0,67	3,10																	
L4C05T235	0,55	0,75	220	0,77	3,10	4																
			230	0,71	3,30			152	253	407												
			240	0,66	3,50																	
L4C07T235	0,75	1	220	0,77	4,00	4																
			230	0,73	4,10			118	196	315												
			240	0,66	4,50																	
L4C11T235	1,1	1,5	220	0,80	5,60	4																
			230	0,76	5,70			80	134	216	323											
			240	0,73	6,20																	
L4C15T235	1,5	2	220	0,77	7,40	4																
			230	0,72	7,60			62	105	169	253	433										
			240	0,68	8,00																	
L4C22T235	2,2	3	220	0,80	10,0	4																
			230	0,78	10,2			43	74	120	180	308										
			240	0,70	10,7																	
L4C30T235	3	4	220	0,77	13,7	4																
			230	0,71	14,3			32	55	90	135	232	362									
			240	0,68	15,2																	
L4C40T235	4	5,5	220	0,81	16,4	4																
			230	0,79	17,3			24	43	71	108	187	292	443								
			240	0,74	18,2																	
L4C55T235	5,5	7,5	220	0,79	23,4	4																
			230	0,74	24,2			-	29	49	75	131	205	312								
			240	0,70	25,0																	
L4C03T405	0,37	0,5	380	0,69	1,50	4																
			400	0,70	1,60			569														
			415	0,67	1,80																	
L4C05T405	0,55	0,75	380	0,77	1,80	4																
			400	0,71	1,90			454														
			415	0,66	2,00																	
L4C07T405	0,75	1	380	0,77	2,30	4																
			400	0,73	2,40			355														
			415	0,66	2,60																	
L4C11T405	1,1	1,5	380	0,80	3,30	4																
			400	0,76	3,40			238	396													
			415	0,73	3,60																	
L4C15T405	1,5	2	380	0,77	4,30	4																
			400	0,72	4,40			189	315													
			415	0,68	4,60																	
L4C22T405	2,2	3	380	0,80	5,80	4																
			400	0,78	5,90			134	224	361												
			415	0,70	6,20																	
L4C30T405	3	4	380	0,77	7,90	4																
			400	0,71	8,30			101	169	273	409											
			415	0,68	8,80																	
L4C40T405	4	5,5	380	0,81	9,50	4																
			400	0,79	10,0			80	136	221	331											
			415	0,74	10,5																	
L4C55T405	5,5	7,5	380	0,79	13,5	4																
			400	0,74	14,0			54	94	153	231	398										
			415	0,70	14,5																	
L4C75T405	7,5	10	380	0,84	17,0	4																
			400	0,79	17,4			-	68	113	172	297	466									
			415	0,75	18,1																	

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l4c-cavi-50-en\_d\_te

## L6C, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>								
							mm <sup>2</sup>	4	6	10	16	25	35	50	70
							A max	42	54	75	100	127	158	192	246
Maximum length in metres															
L6C40T235	4	5,5	220	0,80	17,8	4		65	99	171	268	406	559		
			230	0,75	18,4										
			240	0,70	19,1										
L6C55T235	5,5	7,5	220	0,80	24,1		47	72	125	197	300	413	572		
			230	0,75	24,2										
			240	0,71	25,3										
L6C75T235	7,5	10	220	0,82	30,5		34	54	95	151	231	320	444		
			230	0,78	31,2										
			240	0,73	31,7										
L6C93T235	9,3	12,5	220	0,82	37,6		26	42	76	121	186	258	359	489	
			230	0,80	38,1										
			240	0,79	39,5										
L6C110T235	11	15	220	0,87	43,3		-	33	61	99	153	214	299	412	
			230	0,82	44,2										
			240	0,79	45,0										
L6C150T235	15	20	220	0,84	58,0		-	-	44	73	115	161	226	311	
			230	0,80	57,9										
			240	0,76	59,2										
L6C185T235	18,5	25	220	0,83	70,1		-	-	35	59	94	133	187	257	
			230	0,80	71,0										
			240	0,73	72,7										
L6C220T235	22	30	220	0,88	82,3		-	-	-	46	74	106	152	212	
			230	0,84	81,4										
			240	0,80	82,3										
L6C40T405	4	5,5	380	0,80	10,3		201	301	517						
			400	0,75	10,6										
			415	0,70	11,0										
L6C55T405	5,5	7,5	380	0,80	13,9		147	222	382						
			400	0,75	14,0										
			415	0,71	14,6										
L6C75T405	7,5	10	380	0,82	17,6		112	169	293	459					
			400	0,78	18,0										
			415	0,73	18,3										
L6C93T405	9,3	12,5	380	0,82	21,7		88	135	236	371	565				
			400	0,80	22,0										
			415	0,79	22,8										
L6C110T405	11	15	380	0,87	25,0		71	110	193	305	466				
			400	0,82	25,5										
			415	0,79	26,0										
L6C150T405	15	20	380	0,84	33,5		51	81	145	231	355	493			
			400	0,80	33,4										
			415	0,76	34,2										
L6C185T405	18,5	25	380	0,83	40,5		-	65	119	191	294	409			
			400	0,80	41,0										
			415	0,73	42,0										
L6C220T405	22	30	380	0,88	47,5		-	50	94	153	237	332	467		
			400	0,84	47,0										
			415	0,80	47,5										
L6C300T405	30	40	380	0,89	63,0		-	-	65	109	173	245	346	480	
			400	0,85	61,5										
			415	0,80	63,5										
L6C370T405	37	50	380	0,87	79,5		-	-	-	84	135	193	274	381	
			400	0,84	79,3										
			415	0,80	80,0										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l6c-cavi-50-en\_f\_te



## L6C, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES Y/Δ (STAR / DELTA) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup> + 3 x ...mm <sup>2</sup>												
							mm <sup>2</sup>	4	6	10	16	25	35	50	70				
							A max*	73	94	130	173	220	274	333	426				
Maximum length in metres																			
L6C40T405	4	5,5	380	0,80	10,3	4													
			400	0,75	10,6			352	525										
			415	0,70	11,0														
L6C55T405	5,5	7,5	380	0,80	13,9														
			400	0,75	14,0			259	388										
			415	0,71	14,6														
L6C75T405	7,5	10	380	0,82	17,6														
			400	0,78	18,0			199	299	513									
			415	0,73	18,3														
L6C93T405	9,3	12,5	380	0,82	21,7														
			400	0,80	22,0			160	241	415									
			415	0,79	22,8														
L6C110T405	11	15	380	0,87	25,0														
			400	0,82	25,5		130	197	340	533									
			415	0,79	26,0														
L6C150T405	15	20	380	0,84	33,5														
			400	0,80	33,4		98	150	260	408									
			415	0,76	34,2														
L6C185T405	18,5	25	380	0,83	40,5														
			400	0,80	41,0		80	123	216	340	518								
			415	0,73	42,0														
L6C220T405	22	30	380	0,88	47,5														
			400	0,84	47,0		63	98	173	274	421								
			415	0,80	47,5														
L6C300T405	30	40	380	0,89	63,0														
			400	0,85	61,5		44	70	126	202	312	435							
			415	0,80	63,5														
L6C370T405	37	50	380	0,87	79,5														
			400	0,84	79,3		-	53	99	160	248	347	487						
			415	0,80	80,0														

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l6c-cavi-SD-50-en\_b\_te

\*A max is the maximum rated current of the motor

## L6W, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>								
							mm2	4	6	10	16	25	35	50	70
							A max	42	54	75	100	127	158	192	246
Maximum lenght in metres															
L6W40T405	4	5,5	380	0,90	9,89	4		187	281	484					
			415	0,85	9,13										
L6W55T405	5,5	7,5	380	0,88	12,7			148	222	384					
			415	0,82	12,5										
L6W75T405	7,5	10	380	0,90	17,0			106	161	279	439				
			415	0,84	16,2										
L6W93T405	9,3	12,5	380	0,89	20,5			87	133	233	366	561			
			415	0,83	19,9										
L6W110T405	11	15	380	0,90	24,2			71	110	194	306	470			
			415	0,84	23,4										
L6W130T405	13	17,5	380	0,90	28,1			60	93	165	262	403	561		
			415	0,85	27,0										
L6W150T405	15	20	380	0,88	32,1			52	82	146	233	358	498		
			415	0,82	31,3										
L6W185T405	18,5	25	380	0,89	38,5			-	65	118	190	294	410		
			415	0,83	37,5										
L6W220T405	22	30	380	0,87	47,3			-	51	95,1	155	241	337	472	
			415	0,80	46,7										
L6W260T405	26	35	380	0,85	56,5			-	-	78	129	202	284	398	
			415	0,79	55,7										
L6W300T405	30	40	380	0,87	63,8		-	-	66	110	174	245	346	479	
			415	0,81	62,0										
L6W370T405	37	50	380	0,86	81,8		-	-	-	82	132	188	267	372	
			415	0,80	79,4										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l6w-cavi-50-en\_c\_te

## L6W HT, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup>								
							mm2	4	6	10	16	25	35	50	70
							A max	42	54	75	100	127	158	192	246
Maximum lenght in metres															
L6W40T405 HT	4	5,5	380	0,81	9,81	4		209	313	537					
			415	0,72	10,5										
L6W55T405 HT	5,5	7,5	380	0,84	12,9			152	229	394					
			415	0,75	13,4										
L6W75T405 HT	7,5	10	380	0,85	16,9			113	171	296	464				
			415	0,77	17,3										
L6W93T405 HT	9,3	12,5	380	0,87	20,6			89	135	236	372	568			
			415	0,79	20,8										
L6W110T405 HT	11	15	380	0,88	23,8			74	115	201	317	486			
			415	0,80	23,9										
L6W130T405 HT	13	17,5	380	0,85	28,3			63	98	173	273	419	580		
			415	0,78	28,4										
L6W150T405 HT	15	20	380	0,86	31,8			-	84	151	240	368	511		
			415	0,78	32,5										
L6W185T405 HT	18,5	25	380	0,83	40,3			-	66	120	192	296	411		
			415	0,75	41,6										
L6W220T405 HT	22	30	380	0,82	48,5			-	52,2	97,5	158	246	342	477	
			415	0,74	49,7										
L6W260T405 HT	26	35	380	0,85	55,7			-	-	80	131	205	288	404	
			415	0,77	55,8										
L6W300T405 HT	30	40	380	0,79	68,6		-	-	65	110	173	243	341	467	
			415	0,67	75,2										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l6w-ht-cavi-50-en\_b\_te

## L6W, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES Y/Δ (STAR / DELTA) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup> + 3 x ...mm <sup>2</sup>								
							mm <sup>2</sup>	4	6	10	16	25	35	50	70
							A max*	73	94	130	173	220	274	333	426
Maximum length in metres															
L6W40T405	4	5,5	380	0,90	9,89	4		-	-						
			415	0,85	9,13										
L6W55T405	5,5	7,5	380	0,88	12,7			260	389						
			415	0,82	12,5										
L6W75T405	7,5	10	380	0,90	17,0			189	283	488					
			415	0,84	16,2										
L6W93T405	9,3	12,5	380	0,89	20,5			157	237	408					
			415	0,83	19,9										
L6W110T405	11	15	380	0,90	24,2			131	197	341	535				
			415	0,84	23,4										
L6W130T405	13	17,5	380	0,90	28,1			111	169	293	460				
			415	0,85	27,0										
L6W150T405	15	20	380	0,88	32,1			99	150	261	410				
			415	0,82	31,3										
L6W185T405	18,5	25	380	0,89	38,5			80	122	214	337	517			
			415	0,83	37,5										
L6W220T405	22	30	380	0,87	47,3			64	99,5	176	278	426			
			415	0,80	46,7										
L6W260T405	26	35	380	0,85	56,5			53	83	148	236	362	502		
			415	0,79	55,7										
L6W300T405	30	40	380	0,87	63,8		44	70,2	127	203	313	436			
			415	0,81	62,0										
L6W370T405	37	50	380	0,86	81,8		-	52	96	157	243	340	476		
			415	0,80	79,4										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

L6W-cavi-SD-50-en\_d\_te

\*A max is the maximum rated current of the motor

## L6W HT, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES Y/Δ (STAR / DELTA) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm <sup>2</sup> + 3 x ...mm <sup>2</sup>								
							mm <sup>2</sup>	4	6	10	16	25	35	50	70
							A max*	73	94	130	173	220	274	333	426
Maximum length in metres															
L6W40T405 HT	4	5,5	380	0,81	9,81	4		365	545						
			415	0,72	10,5										
L6W55T405 HT	5,5	7,5	380	0,84	12,9			267	400						
			415	0,75	13,4										
L6W75T405 HT	7,5	10	380	0,85	16,9			200	301	517					
			415	0,77	17,3										
L6W93T405 HT	9,3	12,5	380	0,87	20,6			160	240	414					
			415	0,79	20,8										
L6W110T405 HT	11	15	380	0,88	23,8			136	205	354	555				
			415	0,80	23,9										
L6W130T405 HT	13	17,5	380	0,85	28,3			117	177	306	480				
			415	0,78	28,4										
L6W150T405 HT	15	20	380	0,86	31,8			102	155	269	422				
			415	0,78	32,5										
L6W185T405 HT	18,5	25	380	0,83	40,3			81	124	217	342	521			
			415	0,75	41,6										
L6W220T405 HT	22	30	380	0,82	48,5			66	102	180	285	435			
			415	0,74	49,7										
L6W260T405 HT	26	35	380	0,85	55,7			54	84	150	239	367	509		
			415	0,77	55,8										
L6W300T405 HT	30	40	380	0,79	68,6		-	70,4	128	204	314	434			
			415	0,67	75,2										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l6w-ht-cavi-SD-50-en\_b\_te

\*A max is the maximum rated current of the motor

## L8W, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 1 x ...mm <sup>2</sup>									
							mm2	10	16	25	35	50	70	95	120	
							A max	75	100	127	158	192	246	298	346	
Maximum lenght in metres																
L8W300T405	30	40	380	0,88	64,5	4		64	107	170	240	340	471			
			415	0,85	60,1											
L8W370T405	37	50	380	0,88	80,0			47	82	133	190	270	376	481		
			415	0,85	74,8											
L8W450T405	45	60	380	0,88	95,9			-	65	106	154	221	311	398	494	
			415	0,85	88,6											
L8W520T405	52	70	380	0,87	110			-	-	90	132	191	270	346	429	
			415	0,82	105											
L8W550T405	55	75	380	0,88	118			-	-	81	120	175	248	320	398	
			415	0,84	111											
L8W600T405	60	80	380	0,87	127			-	-	74	111	162	230	297	369	
			415	0,83	121											
L8W670T405	67	90	380	0,87	140		-	-	-	97	144	206	267	333		
			415	0,84	132											
L8W750T405	75	100	380	0,87	155		-	-	-	85	127	183	239	298		
			415	0,83	148											
L8W830T405	83	110	380	0,88	171		-	-	-	-	111	162	213	267		
			415	0,84	162											
L8W930T405	93	125	380	0,88	189		-	-	-	-	97	144	190	239		
			415	0,84	179											

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l8w-cavi-50-en\_c\_te

## L8W HT, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES DOL (DIRECT ON LINE) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 1 x ...mm <sup>2</sup>								
							mm2	10	16	25	35	50	70	95	120
							A max	75	100	127	158	192	246	298	346
Maximum lenght in metres															
L8W300T405 HT	30	40	380	0,87	63,7	4		66	110	174	246	347	480		
			415	0,82	62,2										
L8W370T405 HT	37	50	380	0,88	77,0			-	86	139	198	281	392	500	
			415	0,83	73,7										
L8W450T405 HT	45	60	380	0,86	94,7			-	-	110	159	228	319	407	502
			415	0,80	92,8										
L8W520T405 HT	52	70	380	0,88	111			-	-	88	130	188	265	342	424
			415	0,83	106										
L8W550T405 HT	55	75	380	0,86	116			-	-	85	125	181	256	328	407
			415	0,81	112										
L8W600T405 HT	60	80	380	0,87	125			-	-	-	113	165	234	302	375
			415	0,82	119										
L8W670T405 HT	67	90	380	0,87	137		-	-	-	100	147	211	273	341	
			415	0,81	134										
L8W750T405 HT	75	100	380	0,87	153		-	-	-	86	129	186	242	303	
			415	0,83	147										
L8W830T405 HT	83	110	380	0,87	168		-	-	-	-	114	167	218	273	
			415	0,83	162										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l8w-ht-cavi-50-en\_b\_te

## L8W, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES Y/Δ (STAR / DELTA) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 1 x ...mm <sup>2</sup>								
							mm <sup>2</sup>	6	10	16	25	35	50	70	95
							A max*	94	130	173	220	274	333	426	516
Maximum length in metres															
L8W300T405	30	40	380	0,88	64,5	4		69	124	199	307	428			
			415	0,85	60,1										
L8W370T405	37	50	380	0,88	80,0			52	97	157	245	342	481		
			415	0,85	74,8										
L8W450T405	45	60	380	0,88	95,9			-	78	128	201	283	399		
			415	0,85	88,6										
L8W520T405	52	70	380	0,87	110			-	66	110	175	246	348	481	
			415	0,82	105										
L8W550T405	55	75	380	0,88	118			-	59	101	160	227	321	445	
			415	0,84	111										
L8W600T405	60	80	380	0,87	127			-	54	93	148	211	299	415	528
			415	0,83	121										
L8W670T405	67	90	380	0,87	140			-	-	82	132	189	269	374	477
			415	0,84	132										
L8W750T405	75	100	380	0,87	155			-	-	72	117	169	241	336	430
			415	0,83	148										
L8W830T405	83	110	380	0,88	171		-	-	62,1	103	149	214	301	386	
			415	0,84	162										
L8W930T405	93	125	380	0,88	189		-	-	54	90	132	191	270	348	
			415	0,84	179										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l8w-cavi-SD-50-en\_c\_te

\*A max is the maximum rated current of the motor

## L8W HT, 50 Hz: SIZING OF ETHYLENE-PROPILENE (EPR) CABLES Y/Δ (STAR / DELTA) STARTING

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 1 x ...mm <sup>2</sup> + 3 x ...mm <sup>2</sup>								
							mm <sup>2</sup>	6	10	16	25	35	50	70	95
							A max*	94	130	173	220	274	333	426	516
Maximum length in metres															
L8W300T405 HT	30	40	380	0,87	63,7	4		70	127	203	314	437			
			415	0,82	62,2										
L8W370T405 HT	37	50	380	0,88	77,0			55	101	164	255	356	500		
			415	0,83	73,7										
L8W450T405 HT	45	60	380	0,86	94,7			-	81	133	208	291	409		
			415	0,80	92,8										
L8W520T405 HT	52	70	380	0,88	111			-	64	108	171	242	342	474	
			415	0,83	106										
L8W550T405 HT	55	75	380	0,86	116			-	62	105	166	235	331	458	
			415	0,81	112										
L8W600T405 HT	60	80	380	0,87	125			-	-	95	151	214	304	421	536
			415	0,82	119										
L8W670T405 HT	67	90	380	0,87	137			-	-	84	136	194	275	383	488
			415	0,81	134										
L8W750T405 HT	75	100	380	0,87	153			-	-	73	119	171	244	341	435
			415	0,83	147										
L8W830T405 HT	83	110	380	0,87	168		-	-	-	106	154	220	309	395	
			415	0,83	162										

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 90°C

l8w-ht-cavi-SD-50-en\_b\_te

\*A max is the maximum rated current of the motor

## SPLICE BETWEEN DROP CABLE AND MOTOR CABLE

MOTOR TYPE	POWER kW	TYPE OF SPLICE	FOUR-CORE DROP CABLE - SECTION (mm <sup>2</sup> )												
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150
40S L4C	0,37 - 7,5	Resin-filled method	GR11	GR11	GR12	GR12	GR12	GR13	GR13	GR14	GR14	GR15	GR15	GR16	-
		Heat-shrink method	GT11	GT11	GT12	GT12	GT13	GT14	GT15	GT16	-	-	-	-	-
		Tape method	Self-vulcanizing tape + self-vulcanizing sealing putty and PVC tape (1)												
L6C L6W	4 - 37	Resin-filled method	-	-	GR12	GR12	GR12	GR13	GR13	GR14	GR14	GR15	GR15	GR16	-
		Heat-shrink method	-	-	GT12	GT12	GT13	GT14	GT15	GT16	-	-	-	-	-
		Tape method	Self-vulcanizing tape + self-vulcanizing sealing putty and PVC tape (1)												

MOTOR TYPE	POWER kW	TYPE OF SPLICE	THREE-CORE DROP CABLE - SECTION (mm <sup>2</sup> )												
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150
L6C L6W	4 - 37	Resin-filled method	-	-	GR12	GR12	GR12	GR13	GR13	GR14	GR14	GR15	GR15	GR16	-
		Heat-shrink method	-	-	GT12	GT12	GT13	GT14	GT15	GT16	-	-	-	-	-
		Tape method	Self-vulcanizing tape + PVC tape												

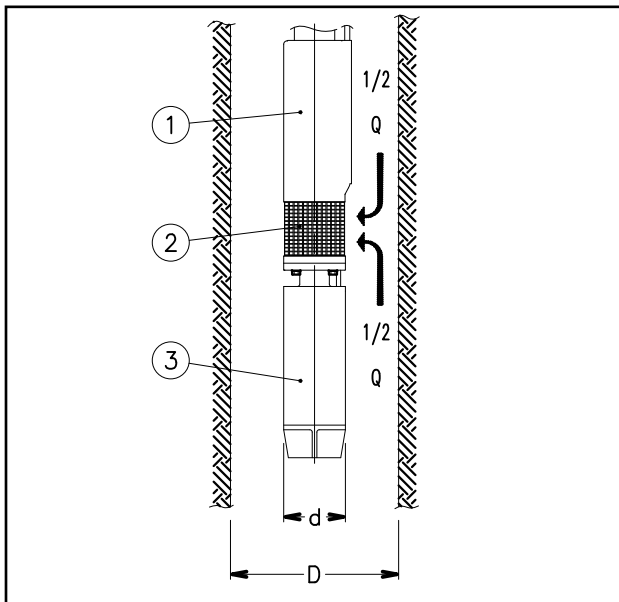
MOTOR TYPE	POWER kW	TYPE OF SPLICE	SINGLE-CORE DROP CABLE - SECTION (mm <sup>2</sup> )												
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150
L8W L10W L12W	30 - 300	Resin-filled method	-	-	-	GR12	GR12	GR17	GR17	GR17	GR18	GR18	GR18	GR19	GR19
		Heat-shrink method	-	-	-	-	-	-	-	-	-	-	-	-	-
		Tape method	Self-vulcanizing tape + PVC tape												

(1) Use self-vulcanizing sealing putty to fill in the gaps between the three-conductor cable and the ground cable in the area covered by the final layer of tape, to restore continuity to the protective sheath.

RESIN-FILLED SPLICES				HEAT-SHRINK SPLICES			
TYPE	L x D [mm]	TYPE	L x D [mm]	TYPE	L x D [mm]	TYPE	L x D [mm]
GR11	190 x 45	GR14	357 x 62	GT11	330	GT14	330
GR12	190 x 51	GR15	325 x 95	GT12	330	GT15	500
GR13	240 x 62	GR16	520 x 100	GT13	330	GT16	500

L-giunzioni-en\_e\_te

## CALCULATING THE SPEED OF THE FLUID THAT FLOWS AROUND A SUBMERGED MOTOR AND SIZING OF THE COOLING SLEEVE



The following formula is used to verify whether the speed of the fluid that flows around the motor of a submersible pump is high enough to guarantee the proper cooling of the motor:

$$v = \frac{\frac{Q}{2}}{\pi \cdot \left( \frac{D^2}{4} - \frac{d^2}{4} \right)}$$

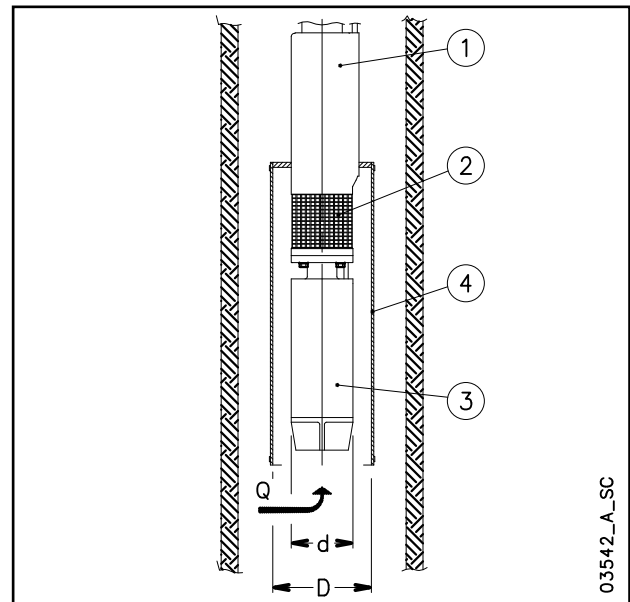
Where:

- Q** in [m<sup>3</sup>/s] is the operating flow rate of the electric pump; only half of this flow is taken into account, because the fluid which is sucked into the area of the filter (2), comes from the motor side (3) as well as from the pump side (1);
- D** in [m] is the diameter of the well;
- d** in [m] is the diameter of the motor (3);
- v** in [m/s] is the calculated speed of the fluid that flows around the motor.

Now, compare the speed thus calculated (v) with the minimum speed required for correct cooling of the motor ( $v_m$ ): if  $v \geq v_m$  it means that the motor is properly cooled, if  $v < v_m$  will be necessary to mount a cooling sleeve (4).

### Example:

An electric pump OZ630/12 (motor diameter  $d = 0.144$  m) operates in an 8" well (well diameter  $D = 0.203$  m) with flow rate  $Q = 20$  m<sup>3</sup>/h =  $0.0055$  m<sup>3</sup>/s. Speed of fluid  $v = (0.0055/2) / \{ \pi \cdot [(0.203)^2/4 - (0.144)^2/4] \} = 0.17$  m/s. The minimum speed required for proper motor cooling is  $v_m = 0.20$  m/s. Because  $v < v_m$ , it will be necessary to mount a cooling sleeve.



The following formula is used to determine the maximum diameter of a cooling sleeve to be mounted on a submersible motor:

$$D = \sqrt{4 \cdot \left( \frac{Q}{v \cdot \pi} + \frac{d^2}{4} \right)}$$

Where:

- Q** in [m<sup>3</sup>/s] is the operating flow rate of the electric pump; the entire flow is taken into account because the fluid comes from the motor side (3) only;
- D** in [m] corresponds to the diameter of the cooling sleeve (4);
- d** in [m] corresponds to the diameter of the motors(3);
- v<sub>m</sub>** in [m/s] is the minimum speed of the fluid that flows around the motor.

If the electric pump operates at different flow rate, the minimum flow rate must be taken into account for calculating the diameter of the cooling sleeve.

### Example:

A motor coupled to the electric pump OZ615/24 (motor diameter  $d = 0.144$  m), which operates with flow rate  $Q = 15$  m<sup>3</sup>/h =  $0.0042$  m<sup>3</sup>/s, requires a minimum speed of the fluid of  $v_m = 0.20$  m/s. Cooling sleeve diameter  $D = \{ 4 \cdot [(0.0042 / (0.2 \cdot \pi)) + (0.144)^2/4] \}^{0.5} = 0.217$  m.

03542\_A\_SC

## ASYNCHRONOUS MOTOR STARTING SYSTEMS

### Direct

Suitable for low-power motors.  
The starting current ( $I_s$ ) is much higher than the rated current ( $I_n$ ).

$$\text{Starting current } I_s = I_n \times 4 \div 8$$

$$\text{Starting torque } T_s = T_n \times 2 \div 3$$

### Indirect

#### • Star/Delta

The starting current ( $I_s$ ) is three times less than the direct starting current.

$$\text{Starting current } I_s = I_n \times 1.3 \div 2.7$$

$$\text{Starting torque } T_s = T_n \times 0.7 \div 1$$

In the star to delta changeover phase (approx. 70 ms) the motor is not supplied and tends to reduce its rotation speed.

In the case of submersible electric pumps with power above 10 HP, the modest mass of the rotor causes a slowdown at changeover, so that the initial Star supply phase is rendered partially useless. In such cases we recommend using impedance panels or an autotransformer.

#### • Impedances

The motor is started with a voltage which is lower than the rated one, and which is obtained by means of impedances.

The Lowara panels use impedances which cut down to 70% the starting voltage.

The switch to the rated voltage takes place without any interruptions of the power supply.

$$\text{Rated voltage } U_n = 400 \text{ V}$$

$$\text{Starting voltage } U_s = U_n \times 0,7 = 280 \text{ V}$$

#### Starting current

$$I_s = I_n \times 4 \div 8 \times \left( \frac{U_s}{U_n} \right) = I_n \times 3 \div 6$$

#### Starting torque

$$T_s = T_n \times 2 \div 3 \times \left( \frac{U_s}{U_n} \right)^2 = T_n \times 1 \div 1,5$$

### Autotransformer

The pump is started with a voltage which is lower than the rated one.

The Lowara panels use an autotransformer with a voltage that is 70% the value of the line voltage.

The switch to the rated voltage occurs without any interruptions of the power supply.

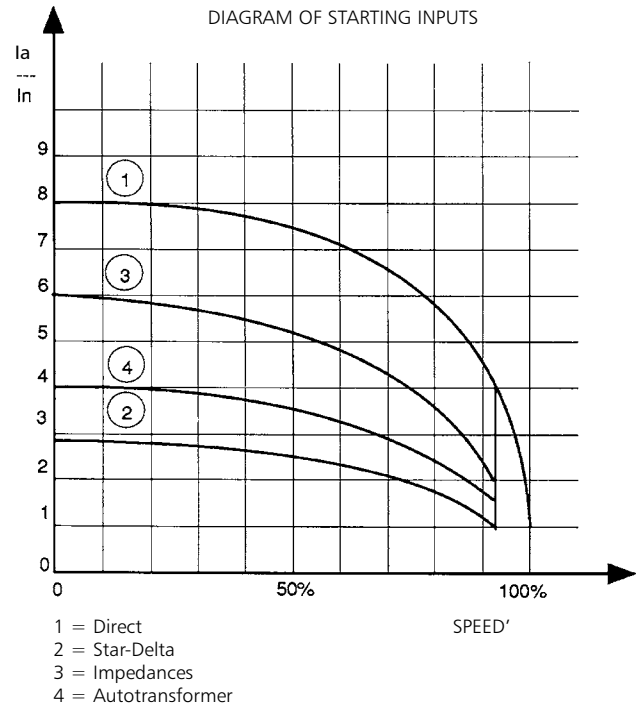
$$\text{Rated voltage } U_n = 400 \text{ V}$$

#### Starting current

$$I_s = I_n \times 4 \div 8 \times \left( \frac{U_s}{U_n} \right) = I_n \times 3 \div 6$$

#### Starting torque

$$T_s = T_n \times 2 \div 3 \times \left( \frac{U_s}{U_n} \right)^2 = T_n \times 1 \div 1,5$$





## WATER REQUIREMENTS IN CIVIL USERS

Determination of the water requirement depends on the type of users and contemporaneity factor. The calculation may be subject to regulations, standards or customs that may vary from country to country. The calculation method shown below is an example based on practical experience, designed to provide a reference value and not a substitute for detailed analytical calculation.

### Water requirements in condominiums.

The **consumption table** shows the maximum values for each delivery point, depending on the plumbing amenities.

### MAXIMUM CONSUMPTION FOR EACH DELIVERY POINT

TYPE	CONSUMPTION (l/min)
Sink	9
Dishwasher	10
Washing machine	12
Shower	12
Bathtub	15
Washbasin	6
Bidet	6
Flush tank WC	6
Controlled flushing system WC	90

The **sum of the water consumption values** of each delivery point determines the maximum theoretical requirement, which must be reduced according to the **contemporaneity coefficient**, because in actual fact the delivery points are never used all together.

$f = \frac{1}{\sqrt{(0,857 \times N_r \times N_a)}}$	Coefficient for apartments with one bathroom and flush tank WC
$f = \frac{1}{\sqrt{(0,857 \times N_r \times N_a)}}$	Coefficient for apartments with one bathroom and controlled flushing system WC
$f = \frac{1,03}{\sqrt{(0,545 \times N_r \times N_a)}}$	Coefficient for apartments with two bathrooms and flush tank WC
$f = \frac{0,8}{\sqrt{(0,727 \times N_r \times N_a)}}$	Coefficient for apartments with two bathrooms and controlled flushing system WC
f= coefficient; Nr= number of delivery points; Na= number of apartments	

The **table of water requirements in civil users** shows the maximum contemporaneity flow-rate values based on the **number of apartments** and the type of WC for apartments with one bathroom and two bathrooms. As regards apartments with one bathroom, 7 drawing points have been taken into consideration, while 11 points have been considered for apartments with two bathrooms. If the number of drawing points or apartments is different, use the formulas to **calculate** the requirement.

## TABLE OF WATER REQUIREMENTS IN CIVIL USERS

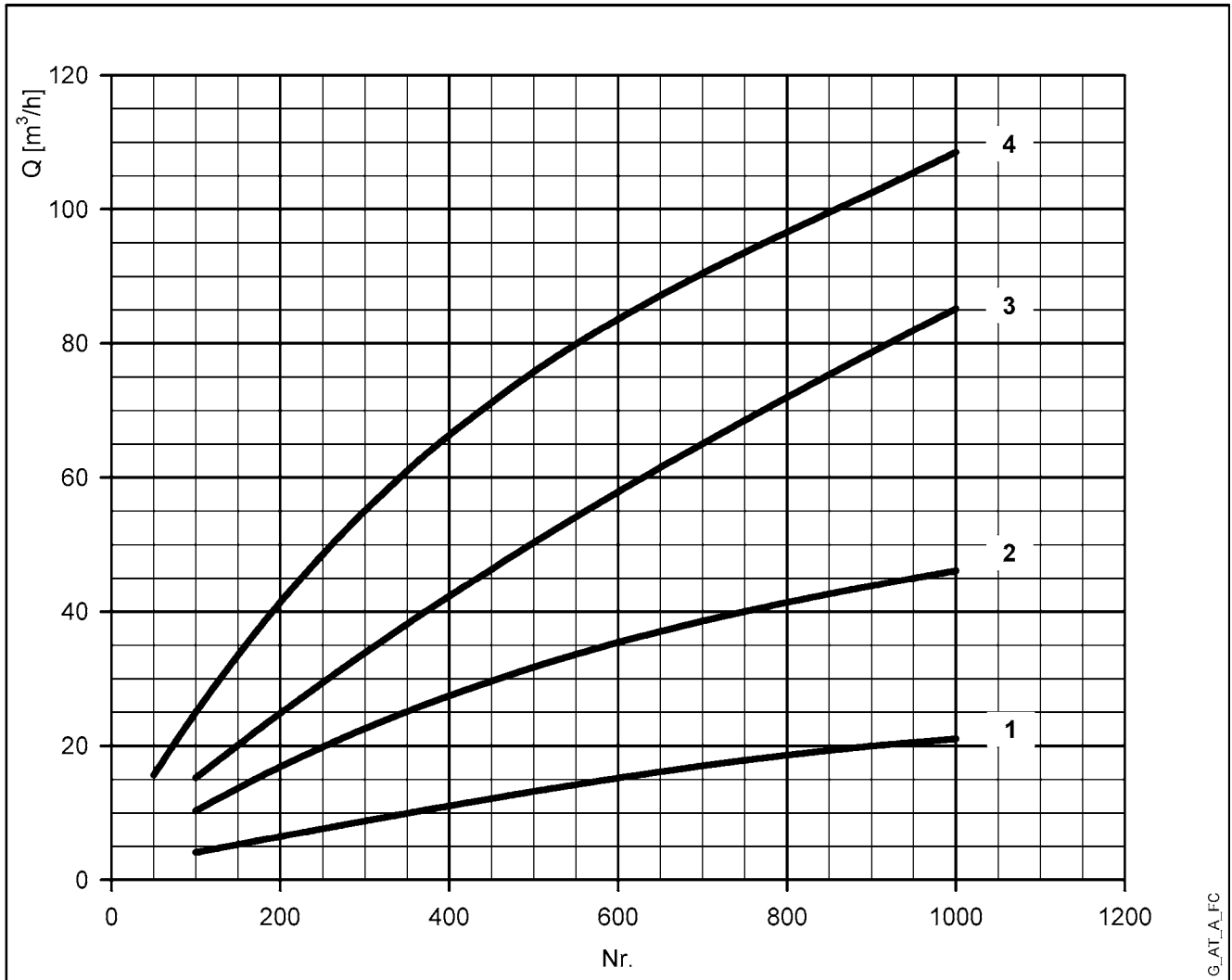
NUMBER OF APARTMENTS	WITH FLUSH TANK WC		WITH CONTROLLED FLUSHING SYSTEM WC	
	1	2	1	2
	FLOW RATE (l/min)			
1	32	40	60	79
2	45	56	85	111
3	55	68	105	136
4	63	79	121	157
5	71	88	135	176
6	78	97	148	193
7	84	105	160	208
8	90	112	171	223
9	95	119	181	236
10	100	125	191	249
11	105	131	200	261
12	110	137	209	273
13	114	143	218	284
14	119	148	226	295
15	123	153	234	305
16	127	158	242	315
17	131	163	249	325
18	134	168	256	334
19	138	172	263	343
20	142	177	270	352
21	145	181	277	361
22	149	185	283	369
23	152	190	290	378
24	155	194	296	386
25	158	198	302	394
26	162	202	308	401
27	165	205	314	409
28	168	209	320	417
29	171	213	325	424
30	174	217	331	431
35	187	234	357	466
40	200	250	382	498
45	213	265	405	528
50	224	280	427	557
55	235	293	448	584
60	245	306	468	610
65	255	319	487	635
70	265	331	506	659
75	274	342	523	682
80	283	354	540	704
85	292	364	557	726
90	301	375	573	747
95	309	385	589	767
100	317	395	604	787
120	347	433	662	863
140	375	468	715	932
160	401	500	764	996
180	425	530	811	1056
200	448	559	854	1114

For seaside resorts, a flow rate increased by at least 20% must be considered.

G-at-fi-en\_a\_th

## WATER REQUIREMENTS FOR COMMUNITY BUILDINGS

The requirements of buildings intended for specific uses, such as **offices, residential units, hotels, department stores, nursing homes** and so on, are different from those of condominiums, and both their global daily water consumption and the maximum contemporaneity flow rate are usually greater. The **diagram of water requirements for community buildings** shows the maximum contemporaneity flow rate of some types of communities, for guidance. These requirements must be determined case by case with the utmost accuracy, using analytical calculation methods, according to particular needs and local provisions.



For seaside resorts, the flow rate must be increased by at least 20%.

- 1= Offices (N. of people)
- 2= Department stores (N. of people)
- 3= Nursing homes (N. of beds)
- 4= Hotels, residences (N. of beds)

## NPSH

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation.

Cavitation is the formation of vapour-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapour pressure of the liquid.

The vapour-filled cavities flow with the current and when they reach a higher pressure area the vapour contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due to fatigue. This phenomenon, characterized by a metallic noise produced by the hammering on the pipe walls, is called incipient cavitation.

The damage caused by cavitation may be magnified by electrochemical corrosion and a local rise in temperature due to the plastic deformation of the walls. The materials that offer the highest resistance to heat and corrosion are alloy steels, especially austenitic steel. The conditions that trigger cavitation may be assessed by calculating the total net suction head, referred to in technical literature with the acronym NPSH (Net Positive Suction Head).

The NPSH represents the total energy (expressed in m.) of the liquid measured at suction under conditions of incipient cavitation, excluding the vapour pressure (expressed in m.) that the liquid has at the pump inlet.

To find the static height  $h_z$  at which to install the machine under safe conditions, the following formula must be verified:

$$h_p + h_z \geq (\text{NPSHr} + 0.5) + h_f + h_{pv} \quad \textcircled{1}$$

where:

**$h_p$**  is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid;  $h_p$  is the quotient between the barometric pressure and the specific weight of the liquid.

**$h_z$**  is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in m.;  $h_z$  is negative when the liquid level is lower than the pump axis.

**$h_f$**  is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.

**$h_{pv}$**  is the vapour pressure of the liquid at the operating temperature, expressed in m. of liquid.  $h_{pv}$  is the quotient between the  $P_v$  vapour pressure and the liquid's specific weight.

**0,5** is the safety factor.

The maximum possible suction head for installation depends on the value of the atmospheric pressure (i.e. the elevation above sea level at which the pump is installed) and the temperature of the liquid.

To help the user, with reference to water temperature (4° C) and to the elevation above sea level, the following tables show the drop in hydraulic pressure head in relation to the elevation above sea level, and the suction loss in relation to temperature.

Water temperature (°C)	20	40	60	80	90	110	120
Suction loss (m)	0,2	0,7	2,0	5,0	7,4	15,4	21,5

Elevation above sea level (m)	500	1000	1500	2000	2500	3000
Suction loss (m)	0,55	1,1	1,65	2,2	2,75	3,3

Friction loss is shown in the tables at pages 117-118 of this catalogue. To reduce it to a minimum, especially in cases of high suction head (over 4-5 m.) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

Make the following calculation:

Liquid: water at ~15°C  $\gamma = 1 \text{ kg/dm}^3$

Flow rate required: 30 m<sup>3</sup>/h

Head for required delivery: 43 m.

Suction lift: 3,5 m.

The selection is an FHE 40-200/75 pump whose NPSH required value is, at 30 m<sup>3</sup>/h, di 2,5 m.

For water at 15 °C

$$h_p = P_a / \gamma = 10,33\text{m}, h_{pv} = P_v / \gamma = 0,174\text{m} (0,01701 \text{ bar})$$

The  $H_f$  flow resistance in the suction line with foot valves is ~ 1,2 m.

By substituting the parameters in formula with the numeric values above, we have:

$$10,33 + (-3,5) \geq (2,5 + 0,5) + 1,2 + 0,17$$

from which we have: 6,8 > 4,4

The relation is therefore verified.

## TECHNICAL APPENDIX VAPOUR PRESSURE $p_s$ VAPOUR PRESSURE AND $\rho$ DENSITY OF WATER TABLE

t °C	T K	$p_s$ bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	$p_s$ bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	$p_s$ bar	$\rho$ kg/dm <sup>3</sup>
0	273,15	0,00611	0,9998	55	328,15	0,15741	0,9857	120	393,15	1,9854	0,9429
1	274,15	0,00657	0,9999	56	329,15	0,16511	0,9852	122	395,15	2,1145	0,9412
2	275,15	0,00706	0,9999	57	330,15	0,17313	0,9846	124	397,15	2,2504	0,9396
3	276,15	0,00758	0,9999	58	331,15	0,18147	0,9842	126	399,15	2,3933	0,9379
4	277,15	0,00813	1,0000	59	332,15	0,19016	0,9837	128	401,15	2,5435	0,9362
5	278,15	0,00872	1,0000	60	333,15	0,1992	0,9832	130	403,15	2,7013	0,9346
6	279,15	0,00935	1,0000	61	334,15	0,2086	0,9826	132	405,15	2,867	0,9328
7	280,15	0,01001	0,9999	62	335,15	0,2184	0,9821	134	407,15	3,041	0,9311
8	281,15	0,01072	0,9999	63	336,15	0,2286	0,9816	136	409,15	3,223	0,9294
9	282,15	0,01147	0,9998	64	337,15	0,2391	0,9811	138	411,15	3,414	0,9276
10	283,15	0,01227	0,9997	65	338,15	0,2501	0,9805	140	413,15	3,614	0,9258
11	284,15	0,01312	0,9997	66	339,15	0,2615	0,9799	145	418,15	4,155	0,9214
12	285,15	0,01401	0,9996	67	340,15	0,2733	0,9793	155	428,15	5,433	0,9121
13	286,15	0,01497	0,9994	68	341,15	0,2856	0,9788	160	433,15	6,181	0,9073
14	287,15	0,01597	0,9993	69	342,15	0,2984	0,9782	165	438,15	7,008	0,9024
15	288,15	0,01704	0,9992	70	343,15	0,3116	0,9777	170	443,15	7,920	0,8973
16	289,15	0,01817	0,9990	71	344,15	0,3253	0,9770	175	448,15	8,924	0,8921
17	290,15	0,01936	0,9988	72	345,15	0,3396	0,9765	180	453,15	10,027	0,8869
18	291,15	0,02062	0,9987	73	346,15	0,3543	0,9760	185	458,15	11,233	0,8815
19	292,15	0,02196	0,9985	74	347,15	0,3696	0,9753	190	463,15	12,551	0,8760
20	293,15	0,02337	0,9983	75	348,15	0,3855	0,9748	195	468,15	13,987	0,8704
21	294,15	0,24850	0,9981	76	349,15	0,4019	0,9741	200	473,15	15,550	0,8647
22	295,15	0,02642	0,9978	77	350,15	0,4189	0,9735	205	478,15	17,243	0,8588
23	296,15	0,02808	0,9976	78	351,15	0,4365	0,9729	210	483,15	19,077	0,8528
24	297,15	0,02982	0,9974	79	352,15	0,4547	0,9723	215	488,15	21,060	0,8467
25	298,15	0,03166	0,9971	80	353,15	0,4736	0,9716	220	493,15	23,198	0,8403
26	299,15	0,03360	0,9968	81	354,15	0,4931	0,9710	225	498,15	25,501	0,8339
27	300,15	0,03564	0,9966	82	355,15	0,5133	0,9704	230	503,15	27,976	0,8273
28	301,15	0,03778	0,9963	83	356,15	0,5342	0,9697	235	508,15	30,632	0,8205
29	302,15	0,04004	0,9960	84	357,15	0,5557	0,9691	240	513,15	33,478	0,8136
30	303,15	0,04241	0,9957	85	358,15	0,5780	0,9684	245	518,15	36,523	0,8065
31	304,15	0,04491	0,9954	86	359,15	0,6011	0,9678	250	523,15	39,776	0,7992
32	305,15	0,04753	0,9951	87	360,15	0,6249	0,9671	255	528,15	43,246	0,7916
33	306,15	0,05029	0,9947	88	361,15	0,6495	0,9665	260	533,15	46,943	0,7839
34	307,15	0,05318	0,9944	89	362,15	0,6749	0,9658	265	538,15	50,877	0,7759
35	308,15	0,05622	0,9940	90	363,15	0,7011	0,9652	270	543,15	55,058	0,7678
36	309,15	0,05940	0,9937	91	364,15	0,7281	0,9644	275	548,15	59,496	0,7593
37	310,15	0,06274	0,9933	92	365,15	0,7561	0,9638	280	553,15	64,202	0,7505
38	311,15	0,06624	0,9930	93	366,15	0,7849	0,9630	285	558,15	69,186	0,7415
39	312,15	0,06991	0,9927	94	367,15	0,8146	0,9624	290	563,15	74,461	0,7321
40	313,15	0,07375	0,9923	95	368,15	0,8453	0,9616	295	568,15	80,037	0,7223
41	314,15	0,07777	0,9919	96	369,15	0,8769	0,9610	300	573,15	85,927	0,7122
42	315,15	0,08198	0,9915	97	370,15	0,9094	0,9602	305	578,15	92,144	0,7017
43	316,15	0,09639	0,9911	98	371,15	0,9430	0,9596	310	583,15	98,70	0,6906
44	317,15	0,09100	0,9907	99	372,15	0,9776	0,9586	315	588,15	105,61	0,6791
45	318,15	0,09582	0,9902	100	373,15	1,0133	0,9581	320	593,15	112,89	0,6669
46	319,15	0,10086	0,9898	102	375,15	1,0878	0,9567	325	598,15	120,56	0,6541
47	320,15	0,10612	0,9894	104	377,15	1,1668	0,9552	330	603,15	128,63	0,6404
48	321,15	0,11162	0,9889	106	379,15	1,2504	0,9537	340	613,15	146,05	0,6102
49	322,15	0,11736	0,9884	108	381,15	1,3390	0,9522	350	623,15	165,35	0,5743
50	323,15	0,12335	0,9880	110	383,15	1,4327	0,9507	360	633,15	186,75	0,5275
51	324,15	0,12961	0,9876	112	385,15	1,5316	0,9491	370	643,15	210,54	0,4518
52	325,15	0,13613	0,9871	114	387,15	1,6362	0,9476	374,15	647,30	221,20	0,3154
53	326,15	0,14293	0,9862	116	389,15	1,7465	0,9460				
54	327,15	0,15002	0,9862	118	391,15	1,8628	0,9445				

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## FLOW RESISTANCE

### TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

ACCESSORY TYPE	DN											
	25	32	40	50	65	80	100	125	150	200	250	300
	Equivalent pipeline length (m)											
45° bend	0,2	0,2	0,4	0,4	0,6	0,6	0,9	1,1	1,5	1,9	2,4	2,8
90° bend	0,4	0,6	0,9	1,1	1,3	1,5	2,1	2,6	3,0	3,9	4,7	5,8
90° smooth bend	0,4	0,4	0,4	0,6	0,9	1,1	1,3	1,7	1,9	2,8	3,4	3,9
Union tee or cross	1,1	1,3	1,7	2,1	2,6	3,2	4,3	5,3	6,4	7,5	10,7	12,8
Gate valve	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Foot check valve	1,1	1,5	1,9	2,4	3,0	3,4	4,7	5,9	7,4	9,6	11,8	13,9
Non return valve	1,1	1,5	1,9	2,4	3,0	3,4	4,7	5,9	7,4	9,6	11,8	13,9

G-a-pcv-en\_b\_th

The table is valid for the Hazen Williams coefficient  $C = 100$  (cast iron pipework). For steel pipework, multiply the values by 1.41. For stainless steel, copper and coated cast iron pipework, multiply the values by 1.85. When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by the manufacturers.

## VOLUMETRIC CAPACITY

Litres per minute l/min	Cubic metres per hour m <sup>3</sup> /h	Cubic feet per hour ft <sup>3</sup> /h	Cubic feet per minute ft <sup>3</sup> /min	Imperial gallon per minute Imp. gal/min	U.S. gallon per minute US gal/min
<b>1,000</b>	0,0600	2,1189	0,0353	0,2200	0,2642
16,6667	<b>1,0000</b>	35,3147	0,5886	3,6662	4,4029
0,4719	0,0283	<b>1,0000</b>	0,0167	0,1038	0,1247
28,3168	1,6990	60,0000	<b>1,0000</b>	6,2288	7,4805
4,5461	0,2728	9,6326	0,1605	<b>1,0000</b>	1,2009
3,7854	0,2271	8,0208	0,1337	0,8327	<b>1,0000</b>

## PRESSURE AND HEAD

Newton per square metre N/m <sup>2</sup>	kilo Pascal kPa	bar bar	Pound force per square inch psi	Metre of water m H <sub>2</sub> O	Millimetre of mercury mm Hg
<b>1,0000</b>	0,0010	$1 \times 10^{-5}$	$1,45 \times 10^{-4}$	$1,02 \times 10^{-4}$	0,0075
1 000,0000	<b>1,0000</b>	0,0100	0,1450	0,1020	7,5006
$1 \times 10^5$	100,0000	<b>1,0000</b>	14,5038	10,1972	750,0638
6 894,7570	6,8948	0,0689	<b>1,0000</b>	0,7031	51,7151
9 806,6500	9,8067	0,0981	1,4223	<b>1,0000</b>	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	<b>1,0000</b>

## LENGTH

Millimetre mm	Centimetre cm	Metre m	Inch in	Foot ft	Yard yd
<b>1,0000</b>	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	<b>1,0000</b>	0,0100	0,3937	0,0328	0,0109
1 000,0000	100,0000	<b>1,0000</b>	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	<b>1,0000</b>	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	<b>1,0000</b>	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	<b>1,0000</b>

## VOLUME

Cubic metre m <sup>3</sup>	Litre L	Millilitre ml	Imperial gallon imp. gal.	U.S. gallon US gal.	Cubic foot ft <sup>3</sup>
<b>1,0000</b>	1 000,0000	$1 \times 10^6$	219,9694	264,1720	35,3147
0,0010	<b>1,0000</b>	1 000,0000	0,2200	0,2642	0,0353
$1 \times 10^{-6}$	0,0010	<b>1,0000</b>	$2,2 \times 10^{-4}$	$2,642 \times 10^{-4}$	$3,53 \times 10^{-5}$
0,0045	4,5461	4 546,0870	<b>1,0000</b>	1,2009	0,1605
0,0038	3,7854	3 785,4120	0,8327	<b>1,0000</b>	0,1337
0,0283	28,3168	28 316,8466	6,2288	7,4805	<b>1,0000</b>

## TEMPERATURE

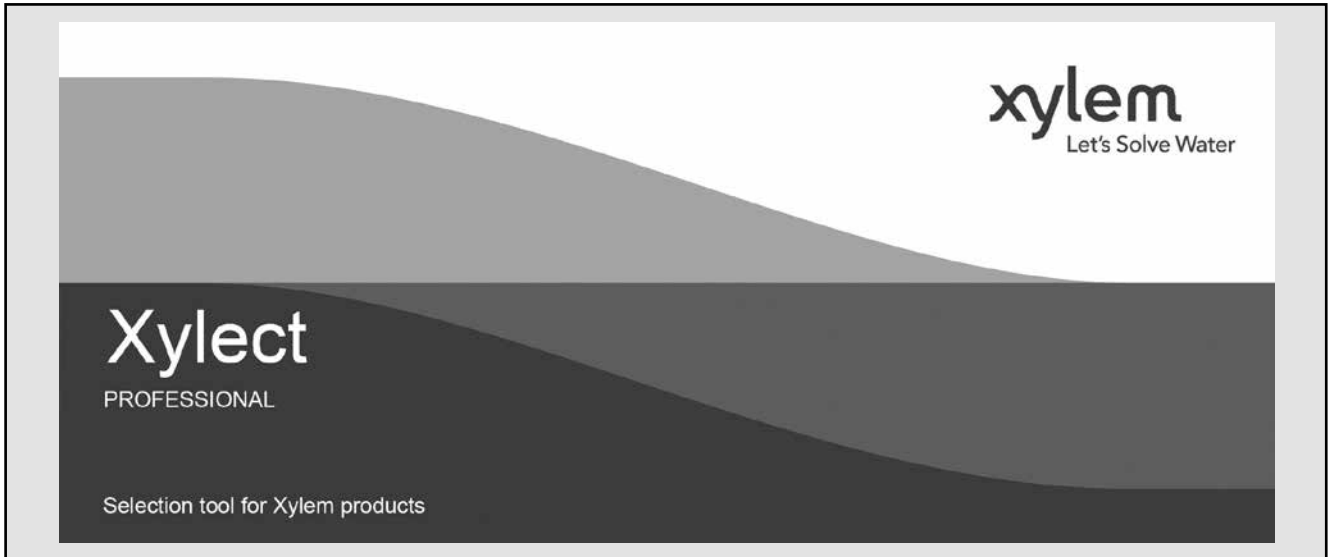
Water	Kelvin K	Celsius °C	Fahrenheit °F	$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$ $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$
icing	273,1500	0,0000	32,0000	
boiling	373,1500	100,0000	212,0000	

G-at\_pp-en\_b\_sc



## FURTHER PRODUCT SELECTION AND DOCUMENTATION

### Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara, and Vogel range of pumps and related products, with multiple search options and helpful project management facilities. The system holds up-to-date product information on thousands of products and accessories.

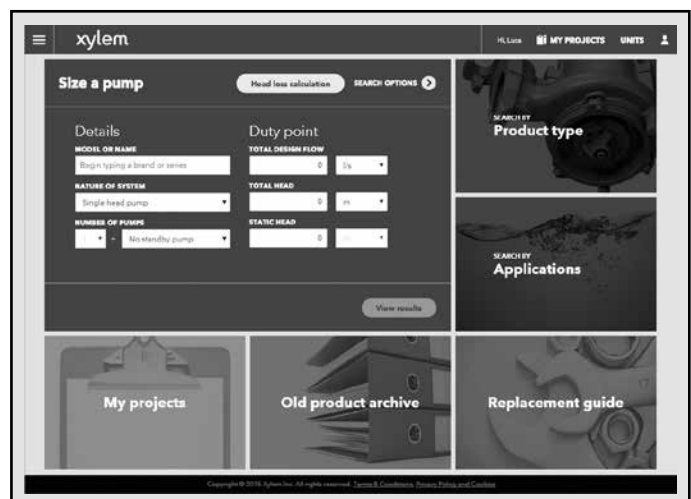
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



*The search by application guides users not familiar with the product range to the right choice.*

## FURTHER PRODUCT SELECTION AND DOCUMENTATION

### Xylect™



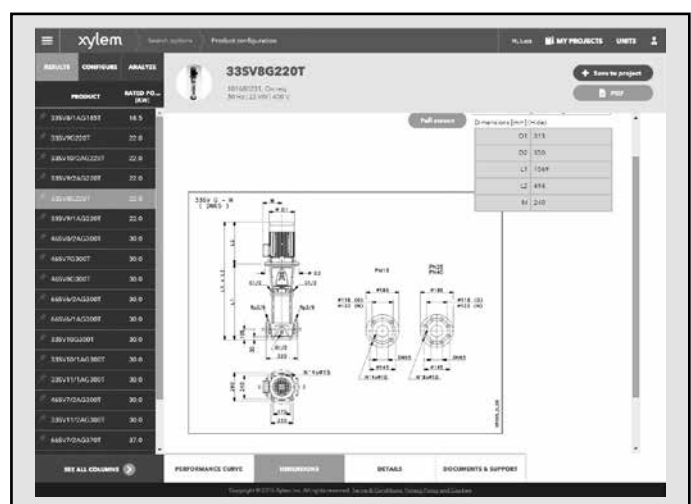
The detailed output makes it easy to select the optimal pump from the given alternatives.

The best way to work with Xylect is to create a personal account. This makes it possible to:

- Set own standard units
- Create and save projects
- Share projects with other Xylect users

Every registered user has a proper space, where all projects are saved.

For more information about Xylect please contact our sales network or visit [www.xylect.com](http://www.xylect.com).



Dimensional drawings appear on the screen and can be downloaded in dxf format.



# Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and reused in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services, and agricultural settings. With its October 2016 acquisition of Sensus, Xylem added smart metering, network technologies and advanced data analytics for water, gas and electric utilities to its portfolio of solutions. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

**For more information on how Xylem can help you, go to [xylem.com](http://xylem.com).**



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