



**ITT**

**Lowara**

Z855, Z875  
Z895, Z8125  
Series

8" Submersible  
Electric Pumps

**50 Hz**



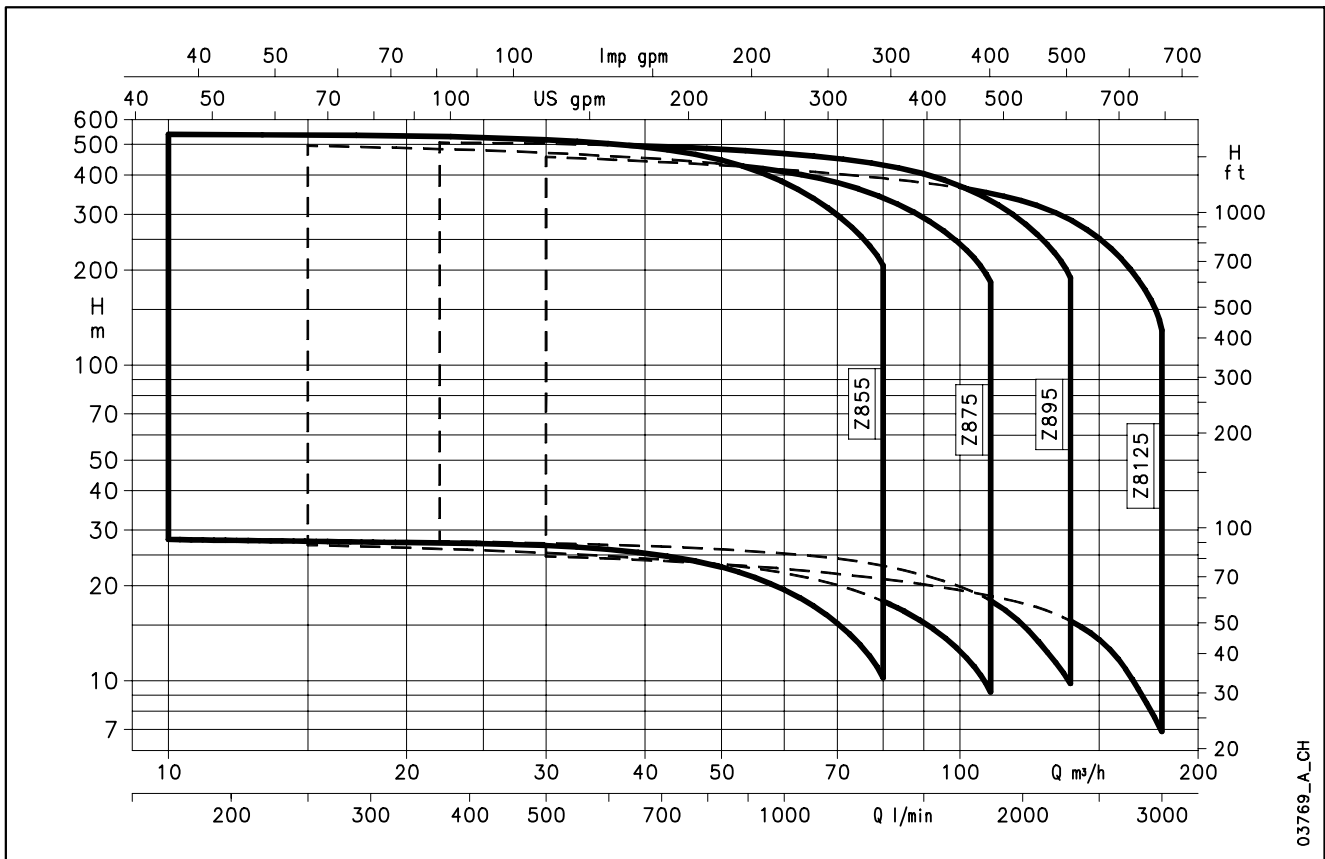
*Engineered for life*



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# Lowara

## Z855, Z875, Z895, Z8125 SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz



03769\_A\_CH



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**Lowara**

## 8" Submersible Electric Pumps

**Z855  
Z875  
Z895  
Z8125  
Series**



### MARKET SECTORS

AGRICULTURAL, INDUSTRIAL.

### APPLICATIONS

- Water supply from deep wells.
- Pressure boosting and water distribution in civil and industrial systems.
- Supply of surge tanks and reservoirs.
- Firefighting and washing systems.
- Water level control.
- Irrigation.
- Mining.

### SPECIFICATIONS PUMP

- **Delivery:** up to 180 m<sup>3</sup>/h.
- **Head:** up to 550 m.
- Maximum pump overall diameter (2 cable covers included): 198 mm for all versions.
- Maximum electric pump immersion depth: 350 m with L6W, L8W, L10W motors.
- Maximum permissible quantity of suspended sand: 100 g/m<sup>3</sup>.
- Standard delivery outlet: Rp 5" for all versions.
- Motor power: from 5,5 to 150 kW.

### MOTOR

- L6W, L8W, L10W rewindable three-phase motors with water filled winding.
- Three-phase version:  
L6W: 4 to 37 kW 380-415 V, 50 Hz.  
L8W: 30 to 93 kW 380-415 V, 50 Hz.  
L10W: 93 to 150 kW 380-415 V, 50 Hz.
- Maximum supply voltage variations: L6W, L8W, L10W 400V ±10%.
- PVC windings for L6W, L8W, L10W.
- Horizontal operation:  
L6W, all versions are designed for horizontal installation, provided that the direction of the axial thrust generated by the impellers is always from the pump to the motor.  
L8W, L10W available on request for all versions.
- Maximum number of starts per hour: 15 (L6W), 10 (L8W) and 8 (L10W).
- Maximum temperature of water in contact with motor:  
L6W, L8W and L10W 25°C.

### CONSTRUCTION FEATURES PUMP

- Robust and lightweight, easy to maintain and corrosion resistant in non-aggressive environments.
  - **Impellers and diffusers** made of **stainless steel**.
  - **Delivery casing** made of **stainless steel**.
  - **Non-return valve** made of **stainless steel, with integrated spring**.
  - **Suction support** made of **stainless steel**.
  - **Shaft** made of **stainless steel**.
- The guide bearing and wear rings ensure high resistance to wear and guarantee the **constant and long-lasting performance of the hydraulic characteristics**.
- Coupling and flange mounting dimensions meet **NEMA** standards.
- ZR8 version in **DUPLEX stainless steel** is also available.

### OPTIONAL FEATURES

#### MOTOR

- Different voltages and frequencies.
- High temperature versions.
- L8W and L10W for horizontal installation.

### ACCESSORIES

- Coupling flange.
- Panels.
- Cables.



## TABLE OF MATERIALS Z8

COMPONENT	MATERIAL	DESIGNATION	
		EUROPE	USA
Delivery head / Valve Casing	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	A744-CF 8
Valve	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	A744-CF 8
Valve seat	NBR 90		
Valve spring	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
Diffuser / Bowl	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	A744-CF 8
Diffuser O-Ring	NBR 70		
Impeller	Stainless steel	EN 10213-4-GX5CrNiMo19-11 (1.4408)	A744-CF 8M
Taperlock	Duplex stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Wear ring	POM (DELTRIN <sup>®</sup> )		
Lower support / Suction Casing	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	A744-CF 8
Suction strainer	Stainless steel	DIN 17440-X6CrNiMoTi17-12-2 (1.4571)	AISI 316Ti
Pump shaft	Stainless steel	EN 10088-1-X17CrNi16-2 (1.4057)	AISI 431
Coupling	Stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Bearing bush	EPDM + LOXAMID <sup>®</sup>		
Thrust Bearing	PTFE + 25% carbon		
Screw, stud, nut	Stainless steel	ISO 3506-1/2 A4-70	AISI 316
Cable protection	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304

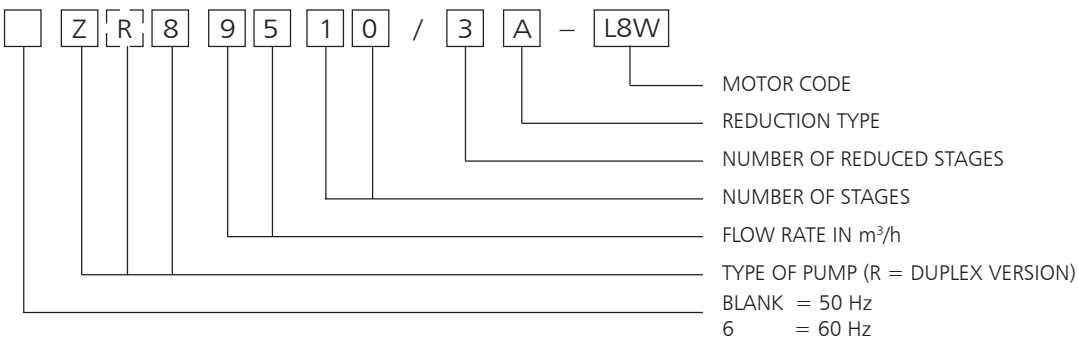
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## TABLE OF MATERIAL ZR8

COMPONENT	MATERIAL	DESIGNATION	
		EUROPE	USA
Delivery head / Valve Casing	Duplex stainless steel	EN 10213-4-GX2CrNiMoCuN25-6-3-3 (1.4517)	
Valve	Duplex stainless steel	EN 10213-4-GX2CrNiMoCuN25-6-3-3 (1.4517)	
Valve seat	NBR 90		
Valve spring	Hastelloy C4	DIN17744-NiMo16Cr16Ti (2.4610)	N06455
Diffuser / Bowl	Duplex stainless steel	EN 10213-4-GX2CrNiMoCuN25-6-3-3 (1.4517)	
Diffuser O-Ring	NBR 70		
Impeller	Duplex stainless steel	EN 10213-4-GX2CrNiMoCuN25-6-3-3 (1.4517)	
Taperlock	Duplex stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Wear ring	POM (DELTRIN <sup>®</sup> )		
Lower support / Suction Casing	Duplex stainless steel	EN 10213-4-GX2CrNiMoCuN25-6-3-3 (1.4517)	
Suction strainer	Stainless steel	EN 10088-1X1NiCrMoCu25-20-5 (1.4539)	AISI 904L
Pump shaft	Duplex stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Coupling	Duplex stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Bearing bush	EPDM + LOXAMID <sup>®</sup>		
Thrust Bearing	PTFE + 25% carbon		
Screw, stud, nut	Duplex stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	A276/A790-S31803
Cable protection	Stainless steel	EN 10088-1X1NiCrMoCu25-20-5 (1.4539)	AISI 904L

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## IDENTIFICATION CODES



EXAMPLE : ZR8 9510/3A - L8W

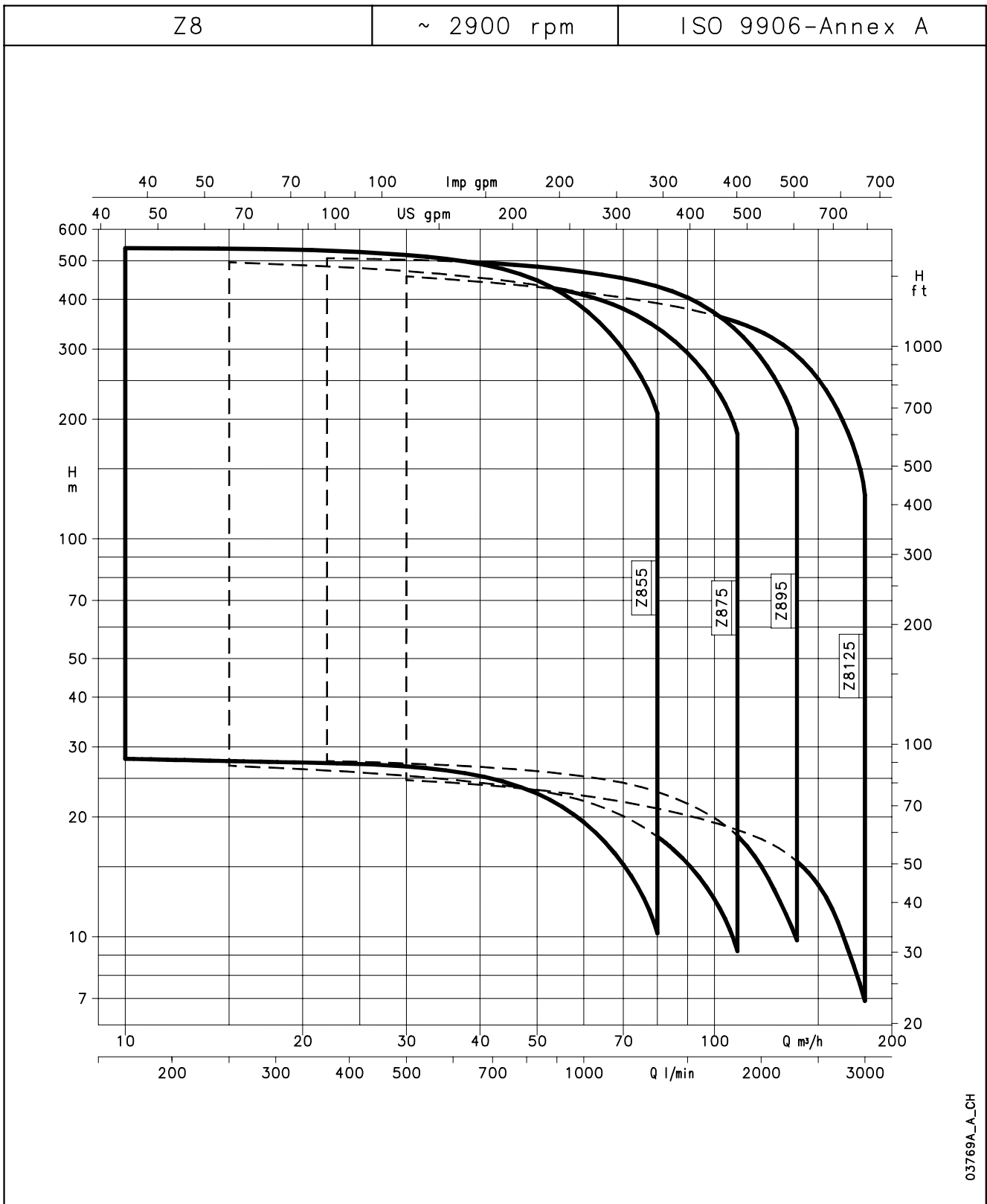
8" electric pump, 50 Hz, made of DUPLEX, flow rate 95 m<sup>3</sup>/h, 10 stages including 3 reduced ones, coupled to an 8" L8W motor.



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## Z8 SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz



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**Z855 SERIES, 1 TO 7 STAGES  
OPERATING CHARACTERISTICS AT 50 Hz**

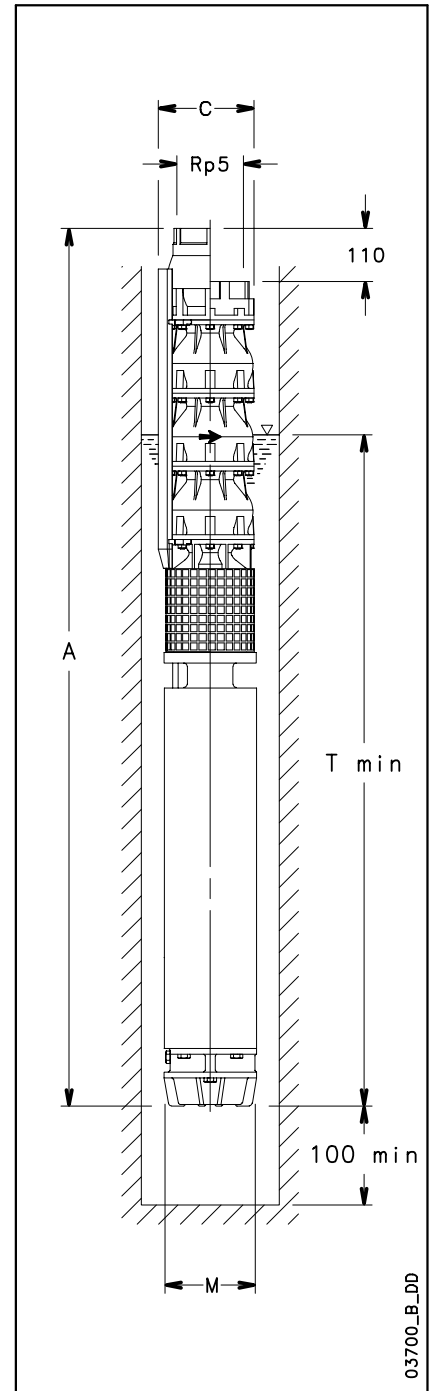
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	167	500	833	1217	1333
		m <sup>3</sup> /h	0	10	30	50	73	80
H = TOTAL HEAD METRES COLUMN OF WATER								
Z855 01	5,5	28,7	28	27	23	14	10,2	
Z855 02/2A	7,5	45,7	44,4	43	35	14,9		
Z855 02/1A	7,5	51,3	49,9	48	40	20,5		
Z855 02	9,3	57	55,6	53	45	27	19,7	
Z855 03/2A	11	74,2	72,1	69	57	27,7		
Z855 03	15	86,1	83,9	80	69	41	30,7	
Z855 04/2A	15	102,7	99,9	96	79	41		
Z855 04	18,5	114,6	111,7	107	91	55	40,7	
Z855 05/3A	18,5	125,6	122,2	117	97	49		
Z855 05/2A	22	132,3	128,8	124	104	56,7		
Z855 05	22	143,5	139,8	134	114	68	50,5	
Z855 06/2A	26	160,7	156,6	150	127	70,9		
Z855 06	30	172	167,6	160	137	83	61,3	
Z855 07/2A	30	188,6	183,6	176	148	82,3		
Z855 07	30	199,7	194,5	186	158	93	68,8	

z855-2p50-en\_b\_th

**DIMENSIONS AND WEIGHTS**

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP WEIGHT kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z855 01-L6W	1173	200	144	1613	68,6
Z855 02/2A-L6W	1348	200	144	1653	81,2
Z855 02/1A-L6W	1348	200	144	1653	81,2
Z855 02-L6W	1378	200	144	1683	85,2
Z855 03/2A-L6W	1553	200	144	1723	97,9
Z855 03-L6W	1663	200	144	1833	109,9
Z855 04/2A-L6W	1798	200	144	1833	118,5
Z855 04-L6W	1868	200	144	1903	126,5
Z855 05/3A-L6W	2003	200	144	1903	135,2
Z855 05/2A-L6W	2043	200	144	1943	138,2
Z855 05-L6W	2043	200	144	1943	138,2
Z855 06/2A-L6W	2306	200	144	2071	155,8
Z855 06-L6W	2386	200	144	2151	163,8
Z855 07/2A-L6W	2521	200	144	2151	172,5
Z855 07-L6W	2521	200	144	2151	172,5

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- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 198 mm with L6W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.

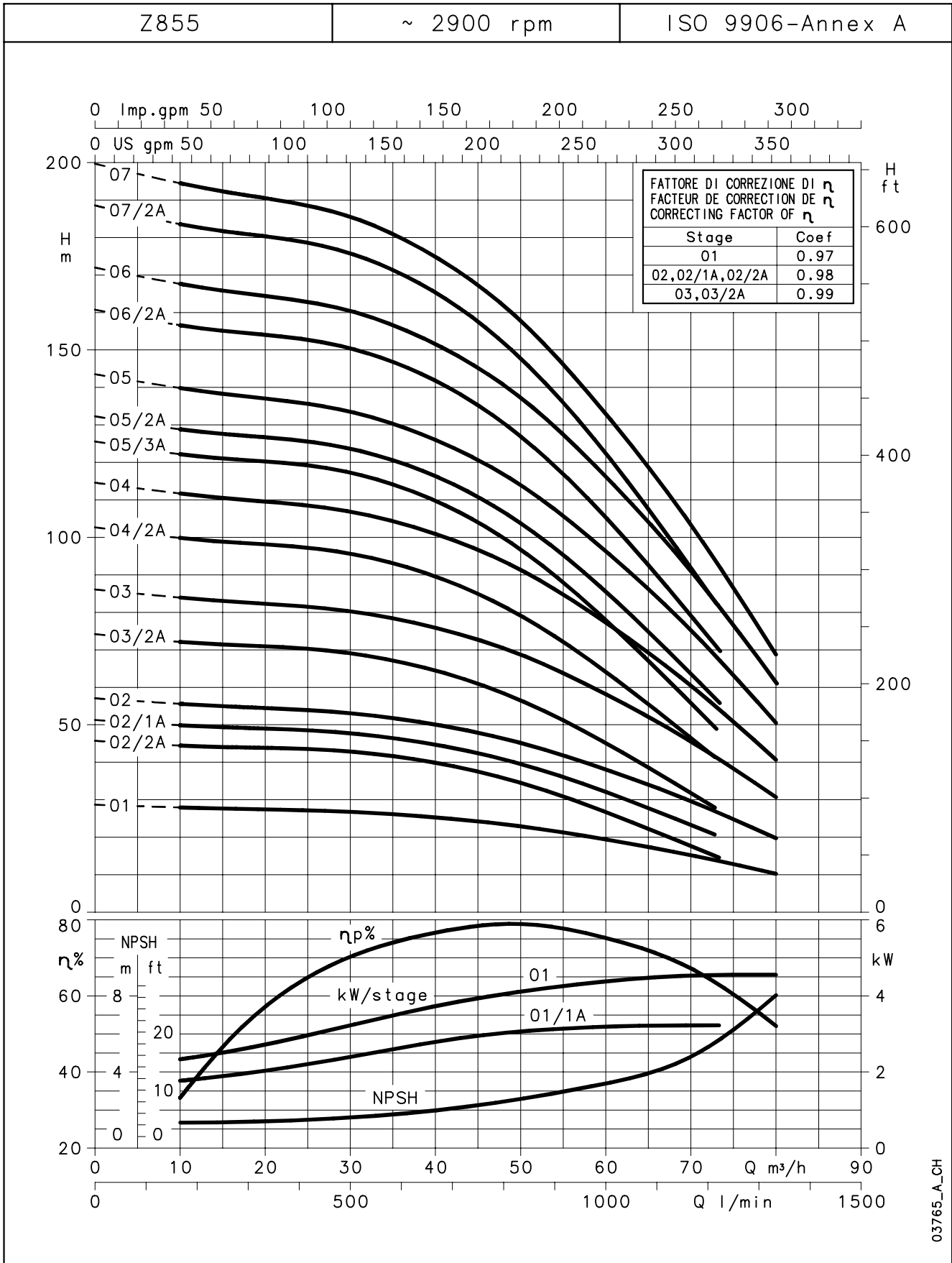




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## Z855 SERIES, 1 TO 7 STAGES OPERATING CHARACTERISTICS AT 50 Hz



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The flow resistance of the non-return valve has been considered.  
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z855 SERIES, 8 TO 19 STAGES OPERATING CHARACTERISTICS AT 50 Hz

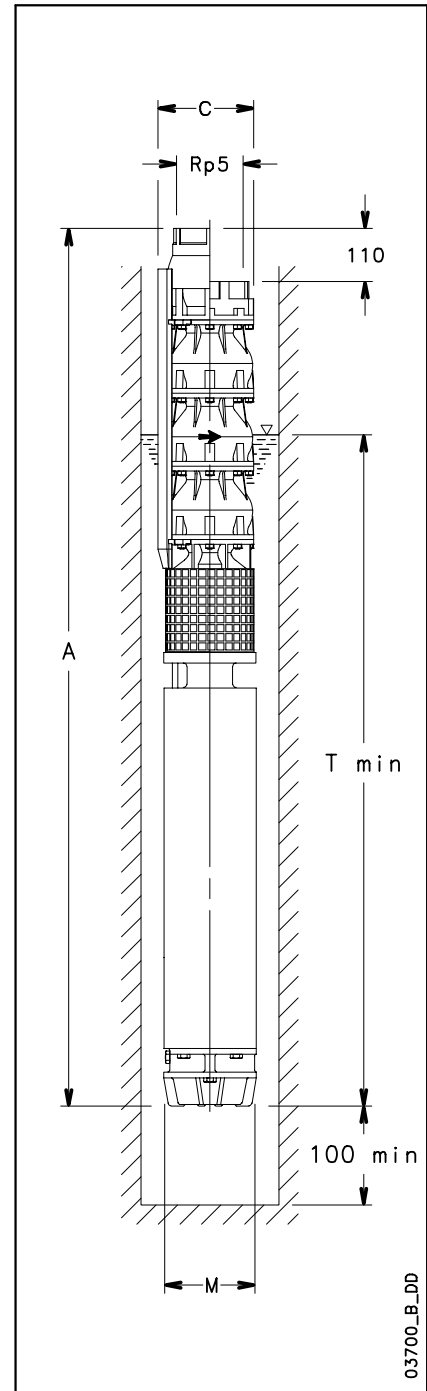
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	167	500	833	1217	1333
		m <sup>3</sup> /h	0	10	30	50	73	80
H = TOTAL HEAD METRES COLUMN OF WATER								
Z855 08/2A	37	217	211,5	202,8	171	96,1		
Z855 08	37	228,3	222,5	212,7	181	107,3	79,4	
Z855 09/2A	37	244,8	238,3	227,8	191,2	106,8		
Z855 09	45	260,6	254,2	244,3	210,6	128,5	96,9	
Z855 10/2A	45	277,5	270,5	260,1	221,5	128,4		
Z855 10	45	288,8	281,7	270,3	231,9	140,2	105,2	
Z855 11/2A	45	305,6	298	286,6	244,8	143,2		
Z855 11	52	316,9	309,2	296,8	255,4	155,4	116,9	
Z855 12	52	346,6	338,3	324,8	279,8	170,5	128,5	
Z855 13	55	375,3	366,1	351,3	302,3	183,7	138,2	
Z855 14	67	404,5	394,7	379,1	326,6	198,9	149,9	
Z855 15	67	432,8	422,2	404,9	348	210,9	158,4	
Z855 16	75	461,6	450,3	432,1	372,2	226,5	170,5	
Z855 17	75	491,8	479,8	461,2	398,8	244,6	185	
Z855 18	83	520	507,3	487,4	420,8	257	194	
Z855 19	93	551,2	538	517	446,3	273,5	206,9	

z855a-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP WEIGHT kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z855 08/2A-L6W	2806	200	144	2301	195,1
Z855 08-L6W	2806	200	144	2301	195,1
Z855 09/2A-L6W	2941	200	144	2301	203,8
Z855 09-L8W	2835	203,3	192	2195	275,1
Z855 10/2A-L8W	2970	203,3	192	2195	283,8
Z855 10-L8W	2970	203,3	192	2195	283,8
Z855 11/2A-L8W	3105	203,3	192	2195	292,4
Z855 11-L8W	3195	203,3	192	2285	312,4
Z855 12-L8W	3330	203,3	192	2285	321,1
Z855 13-L8W	3370	203,3	192	2325	335,7
Z855 14-L8W	3780	203,3	192	2465	373,4
Z855 15-L8W	3915	203,3	192	2465	382
Z855 16-L8W	4140	203,3	192	2555	407,7
Z855 17-L8W	4275	203,3	192	2555	416,3
Z855 18-L8W	4470	203,3	192	2615	438
Z855 19-L8W	4725	203,3	192	2755	471,6

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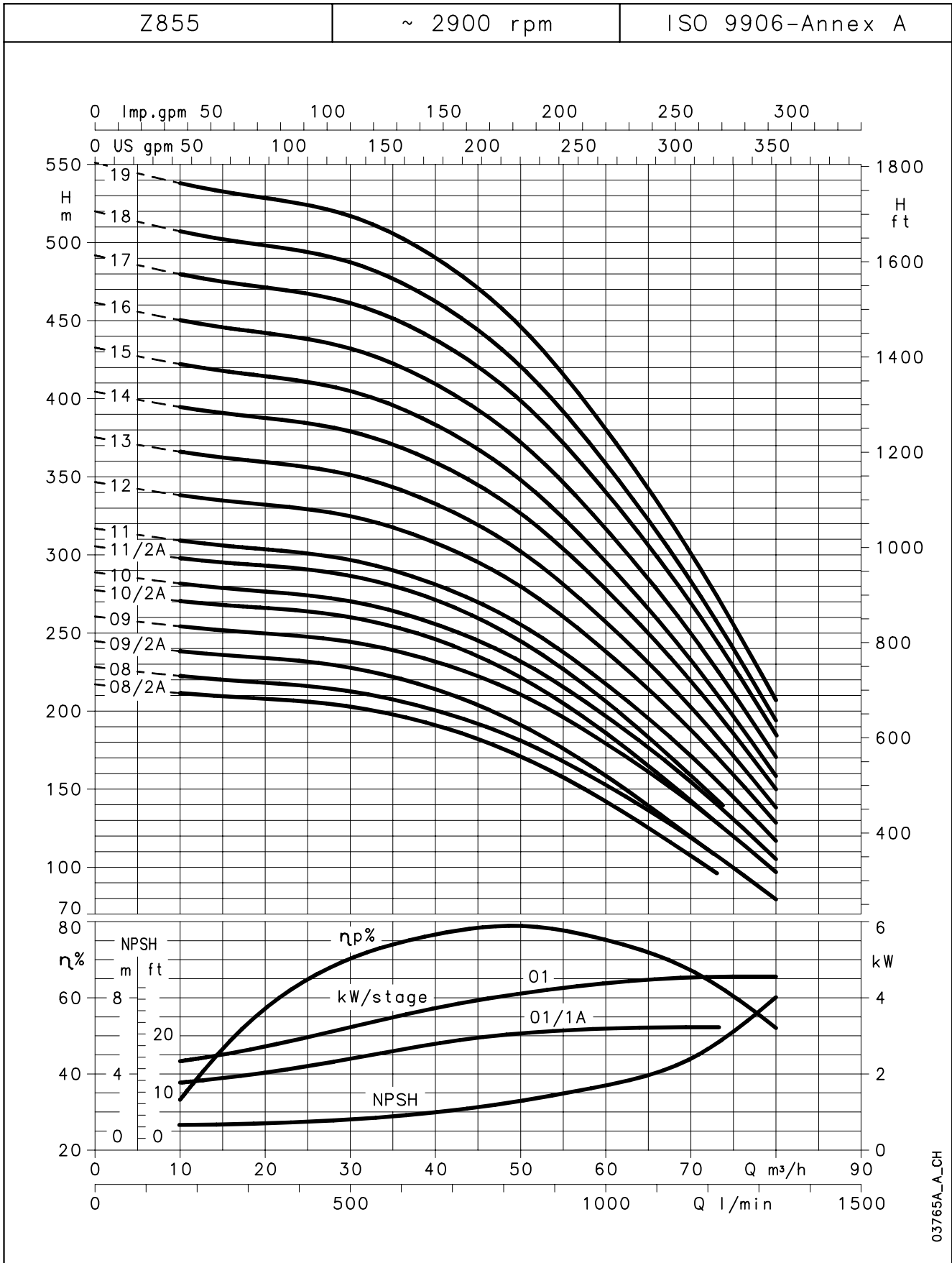
- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 198 mm with L6W motor.  
C = 201,5 mm with L8W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



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## Z855 SERIES, 8 TO 19 STAGES OPERATING CHARACTERISTICS AT 50 Hz



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The flow resistance of the non-return valve has been considered.  
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z875 SERIES, 1 TO 6 STAGES OPERATING CHARACTERISTICS AT 50 Hz

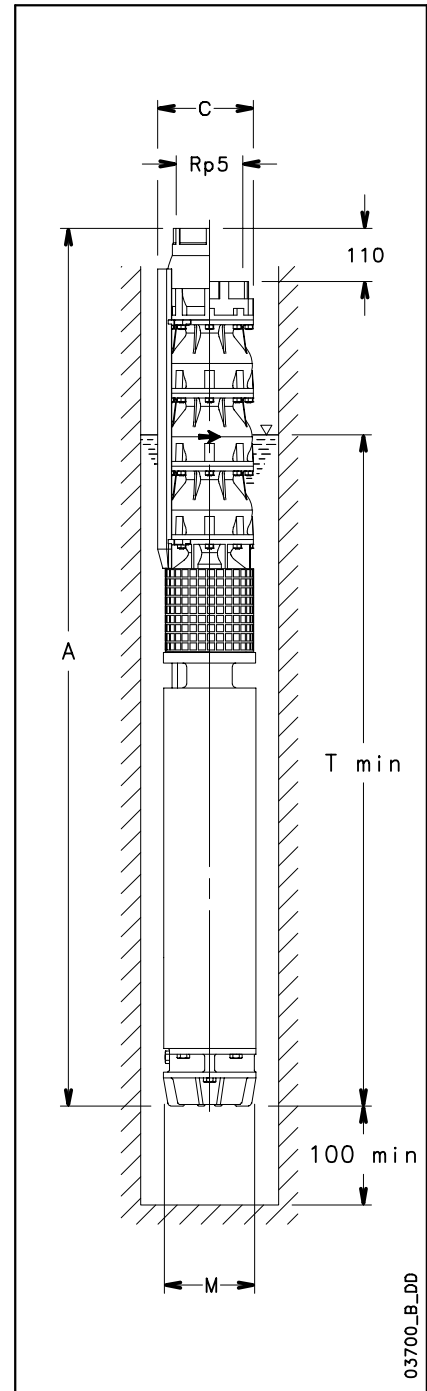
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	250	700	1167	1700	1833
		m <sup>3</sup> /h	0	15	42	70	102	110
H = TOTAL HEAD METRES COLUMN OF WATER								
Z875 01	5,5	28,9	26,9	24,2	20,1	11,8	9,2	
Z875 02/2A	7,5	44,1	42,1	38,2	29,3	11,3		
Z875 02/1A	9,3	50,8	48	43,3	34,7	17,6		
Z875 02	11	57,9	54,1	48,7	40,5	23,9	18,6	
Z875 03/3A	11	66,1	63,1	57,2	43,7	16,9		
Z875 03/2A	13	73,5	69,7	63,3	50,4	24		
Z875 03/1A	15	80,1	75,3	68	55,3	29,8		
Z875 03	18,5	87,5	81,7	73,9	61,8	37	29,1	
Z875 04/2A	18,5	102,3	96,5	87,4	70,3	35,6		
Z875 04	22	116,5	108,8	98,1	81,8	48,8	38,1	
Z875 05/3A	22	124,7	117,9	106,7	85,2	41,4		
Z875 05/2A	26	132,1	124,4	112,9	92,1	49,3		
Z875 05	30	145,3	135,8	122,5	102,3	61	47,7	
Z875 06/2A	30	160	150,4	135,9	110,6	59,7		
Z875 06/1A	30	166,5	156	140,6	115,5	65,8		
Z875 06	37	174,2	162,8	147,1	122,7	73,1	57,2	

z875-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP WEIGHT kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z875 01-L6W	1190	200	144	1613	68,9
Z875 02/2A-L6W	1382	200	144	1653	82,2
Z875 02/1A-L6W	1412	200	144	1683	86,2
Z875 02-L6W	1452	200	144	1723	90,2
Z875 03/3A-L6W	1604	200	144	1723	99,4
Z875 03/2A-L6W	1644	200	144	1763	103,4
Z875 03/1A-L6W	1714	200	144	1833	111,4
Z875 03-L6W	1784	200	144	1903	119,4
Z875 04/2A-L6W	1936	200	144	1903	128,6
Z875 04-L6W	1976	200	144	1943	131,6
Z875 05/3A-L6W	2128	200	144	1943	140,9
Z875 05/2A-L6W	2256	200	144	2071	149,9
Z875 05-L6W	2336	200	144	2151	157,9
Z875 06/2A-L6W	2488	200	144	2151	167,1
Z875 06/1A-L6W	2488	200	144	2151	167,1
Z875 06-L6W	2638	200	144	2301	181,1

z875-2p50-en\_b\_td



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- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 198 mm with L6W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



## Z875 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz

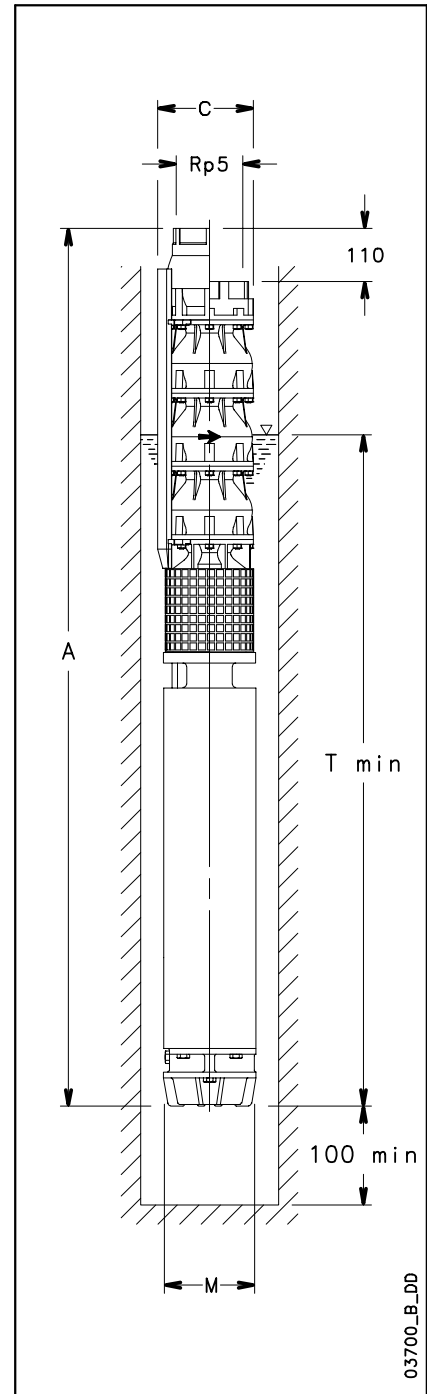
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	250	700	1167	1700	1833
		m <sup>3</sup> /h	0	15	42	70	102	110
		H = TOTAL HEAD METRES COLUMN OF WATER						
Z875 07/2A	37	189	177,5	160,4	131	71,8		
Z875 07	37	202	188,7	169,8	140,8	82,7	64,2	
Z875 08/3A	37	210,1	197,7	178,3	143,9	76,7		
Z875 08/2A	37	221,5	208	188,9	156,2	88,7		
Z875 08	45	234,9	219,6	198,8	166,5	100,6	79,3	
Z875 09/2A	45	249,9	234,6	212,4	175,1	99,1		
Z875 09	52	263,6	246,4	223	187,2	113,3	89,3	
Z875 10/2A	52	278,5	261,3	236,7	196	112,1		
Z875 10	52	291,8	272,7	246,5	206,5	124,1	97,5	
Z875 11/2A	52	308,6	298,4	262,1	217,4	125,1		
Z875 11	55	322,3	301,3	272,5	228,5	138	108,7	
Z875 12	67	352,1	329,1	297,9	249,9	151,1	119,2	
Z875 13	67	381,2	356,4	322,6	271	164,3	129,7	
Z875 14	75	409,5	382,8	346,2	290,3	175,1	137,9	
Z875 15	75	440,2	411,5	373	313,8	190,6	150,7	
Z875 16	83	471,8	441,2	399,6	336	204,6	162,1	
Z875 17	93	500,3	467,8	423,3	355,4	215,7	170,4	
Z875 18	93	530,1	495,7	449,6	378,8	231,2	183,3	

z875a-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP TYPE kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z875 07/2A-L6W	2790	200	144	2301	190,3
Z875 07-L6W	2790	200	144	2301	190,3
Z875 08/3A-L6W	2942	200	144	2301	199,5
Z875 08/2A-L8W	2746	203,3	192	2105	252,9
Z875 08-L8W	2836	203,3	192	2195	270,9
Z875 09/2A-L8W	2988	203,3	192	2195	280,1
Z875 09-L8W	3078	203,3	192	2285	300,1
Z875 10/2A-L8W	3230	203,3	192	2285	309,4
Z875 10-L8W	3230	203,3	192	2285	309,4
Z875 11/2A-L8W	3382	203,3	192	2285	318,6
Z875 11-L8W	3422	203,3	192	2325	324,6
Z875 12-L8W	3714	203,3	192	2465	362,8
Z875 13-L8W	3875	203,3	192	2465	372
Z875 14-L8W	4108	203,3	192	2555	398,3
Z875 15-L8W	4260	203,3	192	2555	407,5
Z875 16-L8W	4472	203,3	192	2615	429,7
Z875 17-L8W	4764	203,3	192	2755	464
Z875 18-L8W	4937	203,3	192	2755	473,2

z875a-2p50-en\_b\_td



03700\_B\_DD

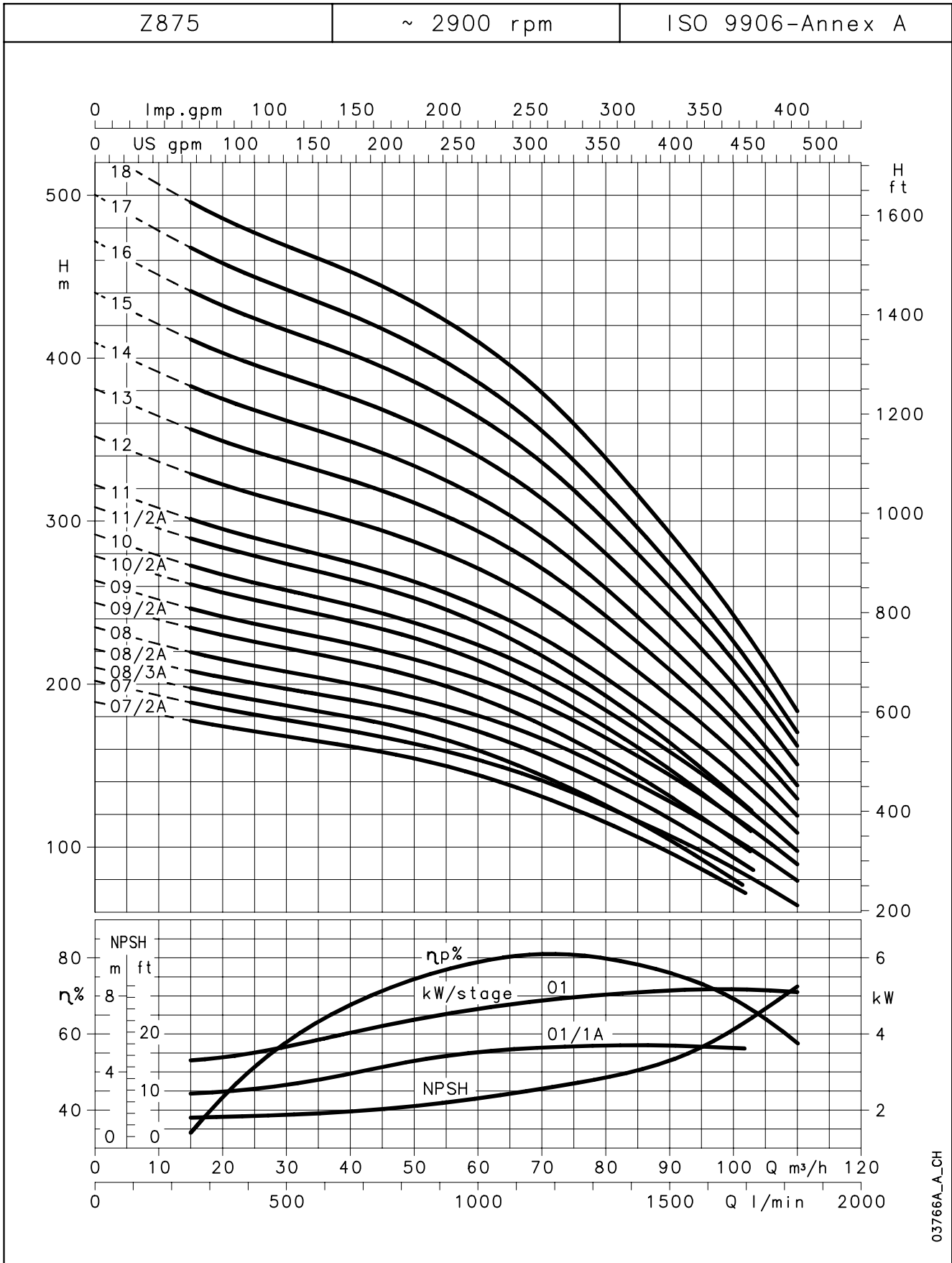
- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 198 mm with L6W motor.  
C = 201,5 mm with L8W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



# ITT

# Lowara

## Z875 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz



03766A\_A\_CH

The flow resistance of the non-return valve has been considered.  
These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z895 SERIES, 1 TO 6 STAGES OPERATING CHARACTERISTICS AT 50 Hz

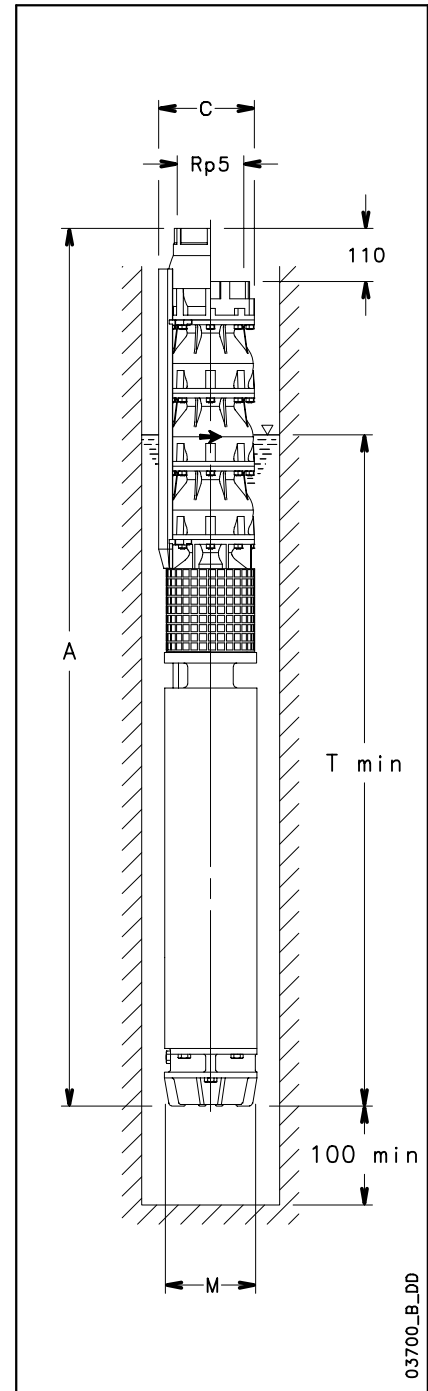
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	367	1000	1500	2150	2300
		m <sup>3</sup> /h	0	22	60	90	129	138
H = TOTAL HEAD METRES COLUMN OF WATER								
Z895 01	7,5	28,5	27,7	25,3	21,6	12,3	9,8	
Z895 02/2B	11	38,7	38,3	35,2	27,5			
Z895 02/2A	13	47,7	46,6	44	36,4	17,8		
Z895 02	15	57	55,4	50,7	43,2	24,6	19,5	
Z895 03/2B	18,5	67,2	66,1	60,8	49,4			
Z895 03/1A	22	81,1	79	73	61,8	34		
Z895 03	26	86	83,8	77,3	66,4	39	30,4	
Z895 04/2B	26	96	94,1	86,7	71,8			
Z895 04/2A	30	104,5	102	94,7	79,7	42,5		
Z895 04	30	113,8	110,7	101,4	86,5	49,3	39,2	
Z895 05/3A	37	128	125	116,4	97,5	50,8		
Z895 05	37	141,9	138	126,4	107,5	60,9	48,7	
Z895 06/3A	45	158,4	154,8	144,6	122,4	67,1		
Z895 06	45	172,6	168,1	154,9	132,8	77,7	60,5	

z895-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP TYPE kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z895 01-L6W	1230	200	144	1653	72,9
Z895 02/2B-L6W	1452	200	144	1723	90,2
Z895 02/2A-L6W	1492	200	144	1763	94,2
Z895 02-L6W	1562	200	144	1833	102,2
Z895 03/2B-L6W	1784	200	144	1903	119,4
Z895 03/1A-L6W	1824	200	144	1943	122,4
Z895 03-L6W	1952	200	144	2071	131,4
Z895 04/2B-L6W	2104	200	144	2071	140,6
Z895 04/2A-L6W	2184	200	144	2151	148,6
Z895 04-L6W	2184	200	144	2151	148,6
Z895 05/3A-L6W	2486	200	144	2301	171,9
Z895 05-L6W	2486	200	144	2301	171,9
Z895 06/3A-L8W	2532	203,3	192	2195	253,1
Z895 06-L8W	2532	203,3	192	2195	253,1

z895-2p50-en\_b\_td



03700\_B\_DD

- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 198 mm with L6W motor.  
C = 201,5 mm with L8W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.

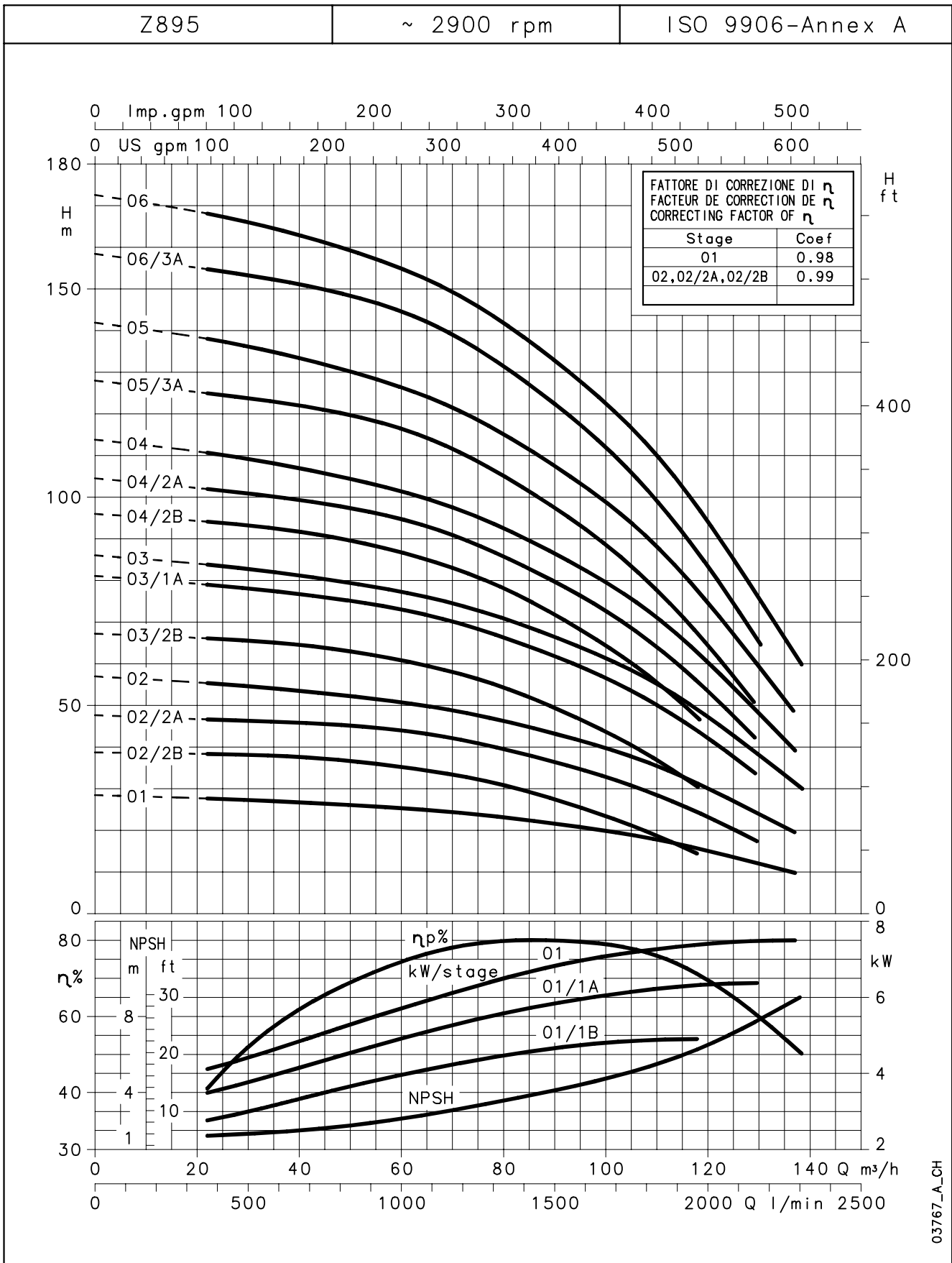




# ITT

# Lowara

## Z895 SERIES, 1 TO 6 STAGES OPERATING CHARACTERISTICS AT 50 Hz



03767\_A\_CH

The flow resistance of the  $\Delta H_v$  non-return valve has been considered.  
 $\Delta H_v = 0,0000533 \cdot Q^2$  Flow resistance = 0,2 / 0,45 / 0,75 m at 60 / 90 / 120 m³/h  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



# ITT

# Lowara

## Z895 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz

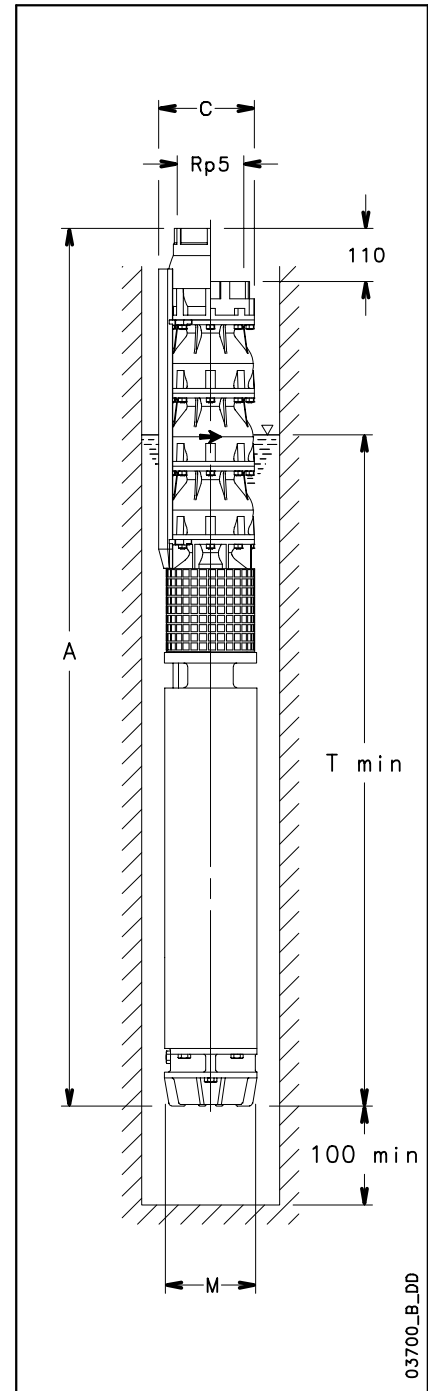
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	367	1000	1500	2150	2300
		m <sup>3</sup> /h	0	22	60	90	129	138
H = TOTAL HEAD METRES COLUMN OF WATER								
Z895 07/3A	52	186,5	182,1	169,6	144	79,8		
Z895 07	52	201,5	196,4	181,3	156,2	92,4	72,4	
Z895 08/3A	55	215,7	210,6	196	166,7	93,3		
Z895 08	60	229,9	223,9	206,3	177,2	104	81,1	
Z895 09/3A	67	244,4	238,6	221,9	188,9	106,2		
Z895 09	67	258,9	252,4	233	200,8	119	93,2	
Z895 10/3A	75	272,9	266,3	247,3	210,9	119,3		
Z895 10	75	287	279,6	257,6	221,5	130	101,4	
Z895 11	83	316,3	308,2	284,6	245,2	145	113,4	
Z895 12	83	346,3	337,6	311,5	268,1	158,8	124,4	
Z895 13	110	374,9	365,6	338,1	291,9	174	137,5	
Z895 14	110	403,1	393	363	312,8	185,4	145,2	
Z895 15	130	434,2	423,5	391,4	337,7	201,8	159	
Z895 16	130	462,6	451	416,2	358,6	213,2	169	
Z895 17	130	490,9	478,4	440,9	379,4	224,2	175,5	
Z895 18	150	520,2	507,1	468,5	404,2	241	189,3	

z895a-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP TYPE kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z895 07/3A-L8W	2774	203,3	192	2285	281,7
Z895 07-L8W	2774	203,3	192	2285	281,7
Z895 08/3A-L8W	2966	203,3	192	2325	296,9
Z895 08-L8W	3016	203,3	192	2375	307,9
Z895 09/3A-L8W	3258	203,3	192	2465	335,1
Z895 09-L8W	3258	203,3	192	2465	335,1
Z895 10/3A-L8W	3500	203,3	192	2555	361,4
Z895 10-L8W	3500	203,3	192	2555	361,4
Z895 11-L8W	3712	203,3	192	2615	383,6
Z895 12-L8W	3864	203,3	192	2615	392,8
Z895 13-L10W	4124	236	236	2702	538
Z895 14-L10W	4276	236	236	2702	547,3
Z895 15-L10W	4578	236	236	2852	603,5
Z895 16-L10W	4730	236	236	2852	612,7
Z895 17-L10W	4882	236	236	2852	622
Z895 18-L10W	5164	236	236	2982	670,2

z895a-2p50-en\_b\_td



03700\_B\_DD

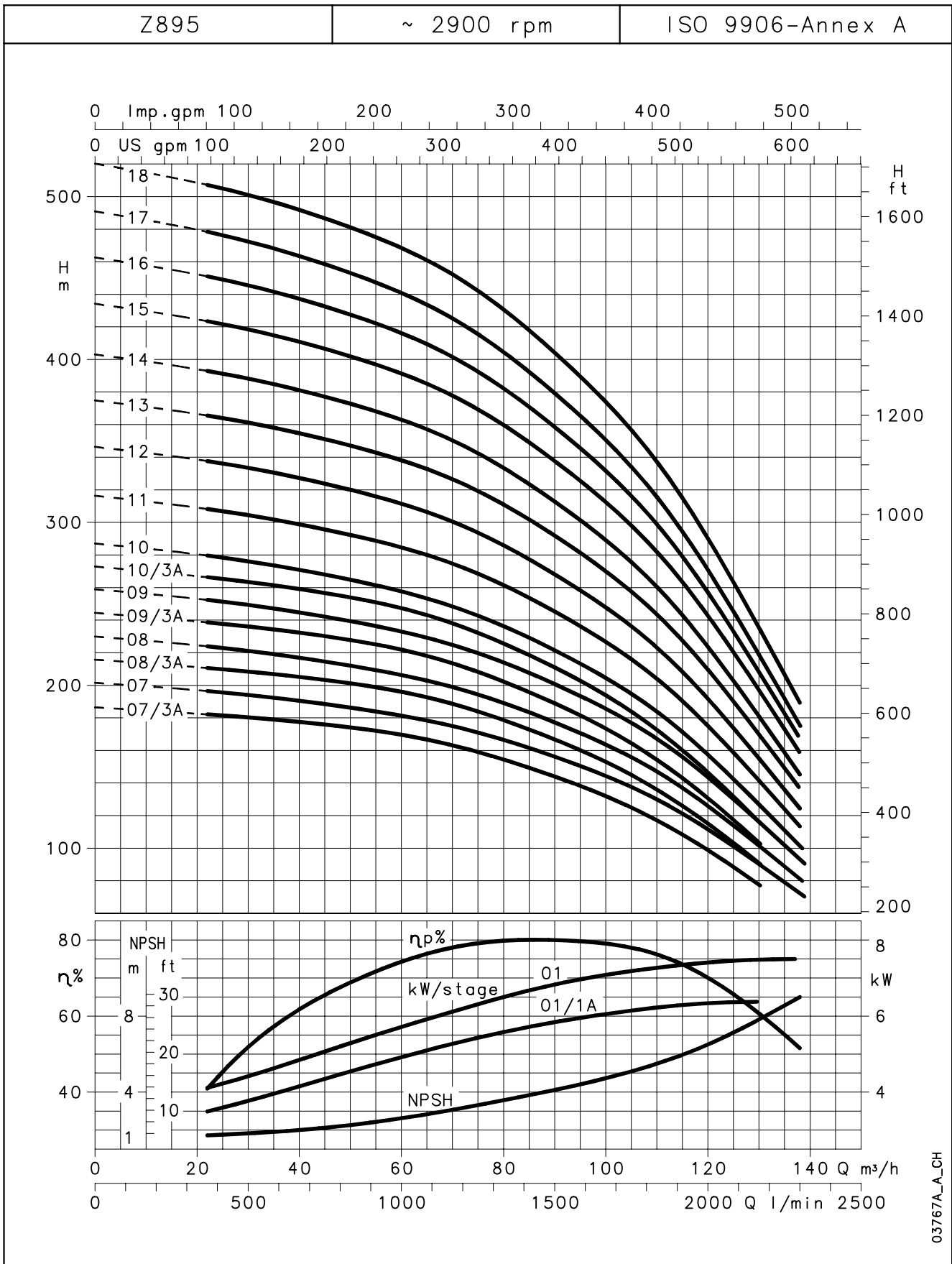
- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 201,5 mm with L8W motor.  
C = 236 mm with L10W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



# ITT

# Lowara

## Z895 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz



03767A\_A-CH

The flow resistance of the ΔHv non-return valve has been considered.  
 $\Delta H_v = 0,0000533 \cdot Q^2$  Flow resistance = 0,2 / 0,45 / 0,75 m at 60 / 90 / 120 m³/h  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## Z8125 SERIES, 1 TO 6 STAGES OPERATING CHARACTERISTICS AT 50 Hz

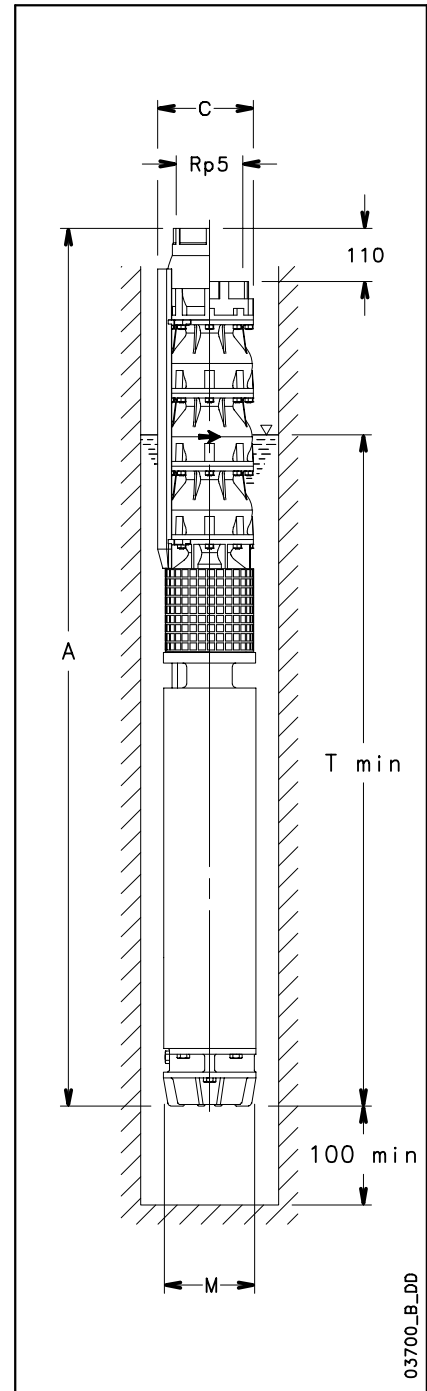
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	500	1333	2083	2800	3000
		m <sup>3</sup> /h	0	30	80	125	168	180
H = TOTAL HEAD METRES COLUMN OF WATER								
Z8125 01	7,5	27,1	24,7	21	17,1	9,4	6,9	
Z8125 02/2B	11	41,9	38,8	31,8	22,3			
Z8125 02/2A	13	48,3	44,6	37,5	28,9	13		
Z8125 02	15	54,3	49,5	42	34,1	18,8	13,7	
Z8125 03/3A	18,5	71,9	66,2	55,5	42,6	19,3		
Z8125 03	22	81,7	74,6	63,4	51,5	28,7	20,7	
Z8125 04/2B	26	97	89,2	74,8	57,5			
Z8125 04/2A	30	102,6	94,1	79,5	63,1	32,9		
Z8125 04	30	108,5	99	84,1	68,3	37,8	27,5	
Z8125 05/3A	37	126,4	116	97,9	77,1	39,3		
Z8125 05	37	135,2	123,4	104,7	84,8	46,6	34,2	
Z8125 06/3A	45	156,4	143,5	121,7	97,1	50,2		
Z8125 06	45	165,5	151,1	128,8	105	60	41,9	

z8125-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP WEIGHT kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z8125 01-L6W	1230	200	144	1653	72,9
Z8125 02/2B-L6W	1452	200	144	1723	90,2
Z8125 02/2A-L6W	1492	200	144	1763	94,2
Z8125 02-L6W	1562	200	144	1833	102,2
Z8125 03/3A-L6W	1784	200	144	1903	119,4
Z8125 03-L6W	1824	200	144	1943	122,4
Z8125 04/2B-L6W	2104	200	144	2071	140,6
Z8125 04/2A-L6W	2184	200	144	2151	148,6
Z8125 04-L6W	2184	200	144	2151	148,6
Z8125 05/3A-L6W	2486	200	144	2301	171,9
Z8125 05-L6W	2486	200	144	2301	171,9
Z8125 06/3A-L8W	2532	203,3	192	2195	253,1
Z8125 06-L8W	2532	203,3	192	2195	253,1

z8125-2p50-en\_b\_td



03700\_B\_DD

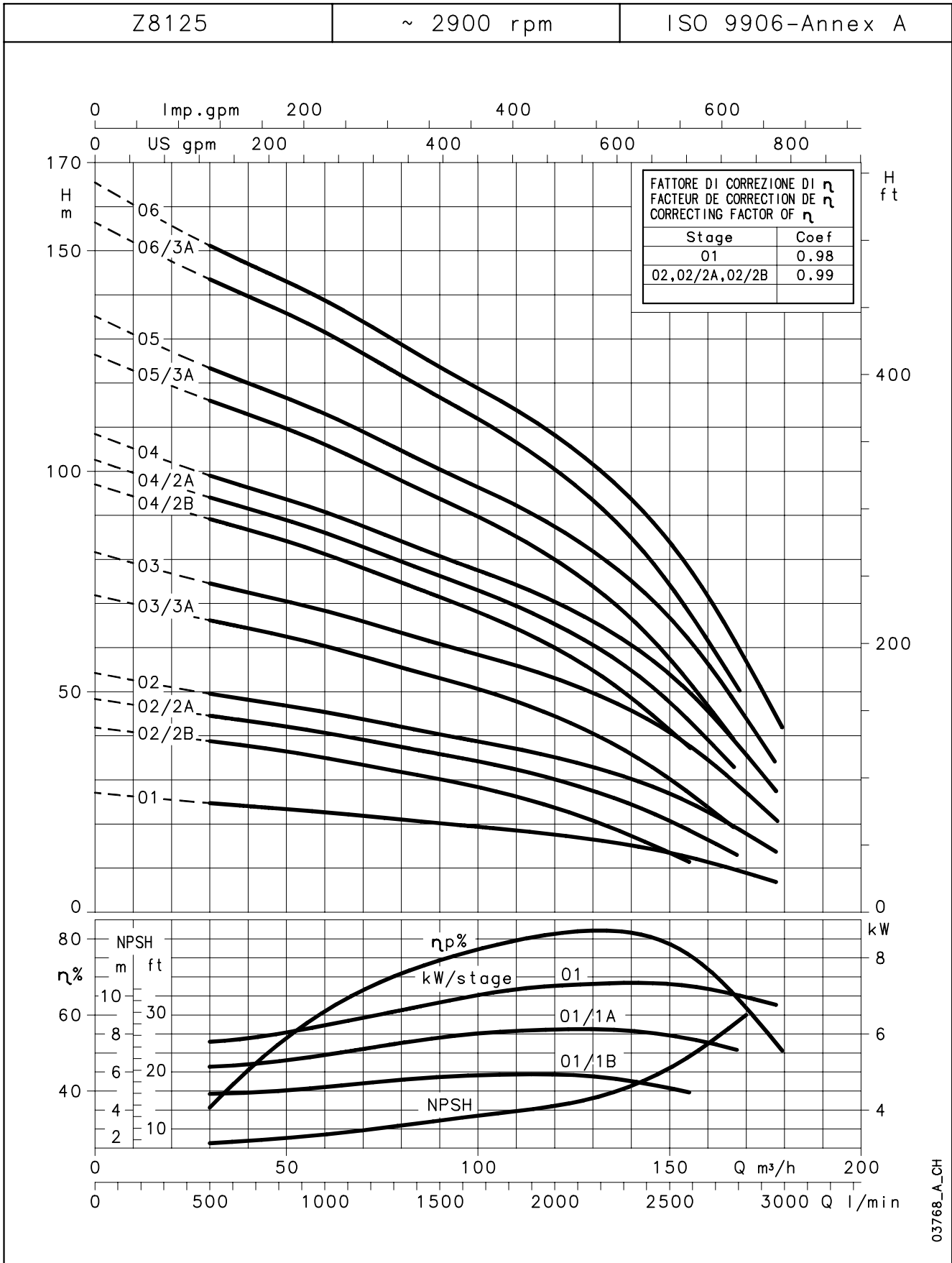
- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 201,5 mm with L8W motor.  
C = 236 mm with L10W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



# ITT

# Lowara

## Z8125 SERIES, 1 TO 6 STAGES OPERATING CHARACTERISTICS AT 50 Hz



03768\_A\_CH

The flow resistance of the  $\Delta H_v$  non-return valve has been considered.  
 $\Delta H_v = 0,0000533 \cdot Q^2$  Flow resistance = 0,35 / 0,75 / 1,35 m at 80 / 120 / 160 m³/h  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



# ITT

# Lowara

## Z8125 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz

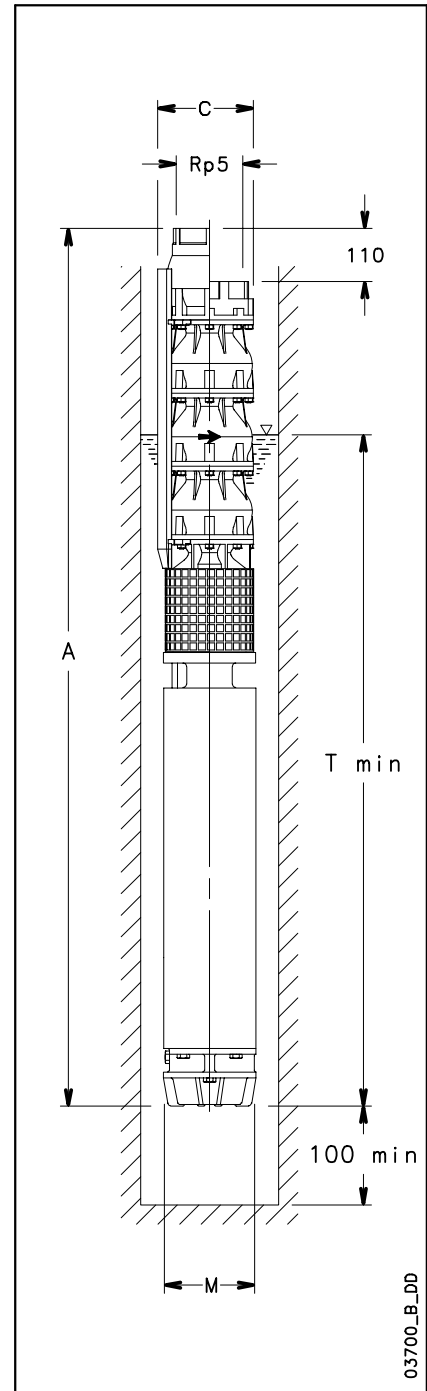
PUMP TYPE	MOTOR POWER kW	Q = DELIVERY						
		l/min	0	500	1333	2083	2800	3000
		m <sup>3</sup> /h	0	30	80	125	168	180
		H = TOTAL HEAD METRES COLUMN OF WATER						
Z8125 07/3A	52	183,3	168	142,6	114,3	60,2		
Z8125 07	52	192,3	175,6	149,8	122,5	69,8	48,8	
Z8125 08/3A	55	210,9	193,2	164,1	131,8	70,3		
Z8125 08	60	220,5	201,3	171,8	140,4	80,3	55,9	
Z8125 09/3A	67	239	218,9	186	149,8	80,6		
Z8125 09	67	248,1	226,5	193,2	157,8	90,3	62,9	
Z8125 10/3A	75	266,2	243,7	207,3	167,4	90,7		
Z8125 10	75	275,3	251,4	214,6	175,4	100,3	69,9	
Z8125 11	83	304,2	277,8	237,4	194,4	112,2	76,8	
Z8125 12	93	332,7	303,9	259,6	212,5	123	84,5	
Z8125 13	93	361,2	329,9	282,3	231,6	134,9	93,1	
Z8125 14	110	387,9	354,2	302,8	248	143,5	98,5	
Z8125 15	110	414,3	378,3	323	264,2	151,9	104	
Z8125 16	130	444,5	406	347	284,4	165,3	113,9	
Z8125 17	130	470,9	430,1	367,3	300,6	173,7	119,5	
Z8125 18	150	500,4	457,1	391	320,8	186,8	128,9	

z8125a-2p50-en\_b\_th

## DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	DIMENSIONS (mm)				ELECTRO PUMP WEIGHT kg <sup>(3)</sup>
	A <sup>(4)</sup>	C <sup>(1)</sup>	M	Tmin <sup>(2)</sup>	
Z8125 07/3A-L8W	2774	203,3	192	2285	281,7
Z8125 07-L8W	2774	203,3	192	2285	81,72
Z8125 08/3A-L8W	2966	203,3	192	2325	296,9
Z8125 08-L8W	3016	203,3	192	2375	307,9
Z8125 09/3A-L8W	3258	203,3	192	2465	335,1
Z8125 09-L8W	3258	203,3	192	2465	335,1
Z8125 10/3A-L8W	3500	203,3	192	2555	361,4
Z8125 10-L8W	3500	203,3	192	2555	361,4
Z8125 11-L8W	3712	203,3	192	2615	383,6
Z8125 12-L8W	4004	203,3	192	2755	417,8
Z8125 13-L8W	4156	203,3	192	2755	427
Z8125 14-L10W	4276	236	236	2702	547,3
Z8125 15-L10W	4428	236	236	2702	556,5
Z8125 16-L10W	4730	236	236	2852	612,7
Z8125 17-L10W	4882	236	236	2852	622
Z8125 18-L10W	5164	236	236	2982	670,2

z8125a-2p50-en\_b\_td



03700\_B\_DD

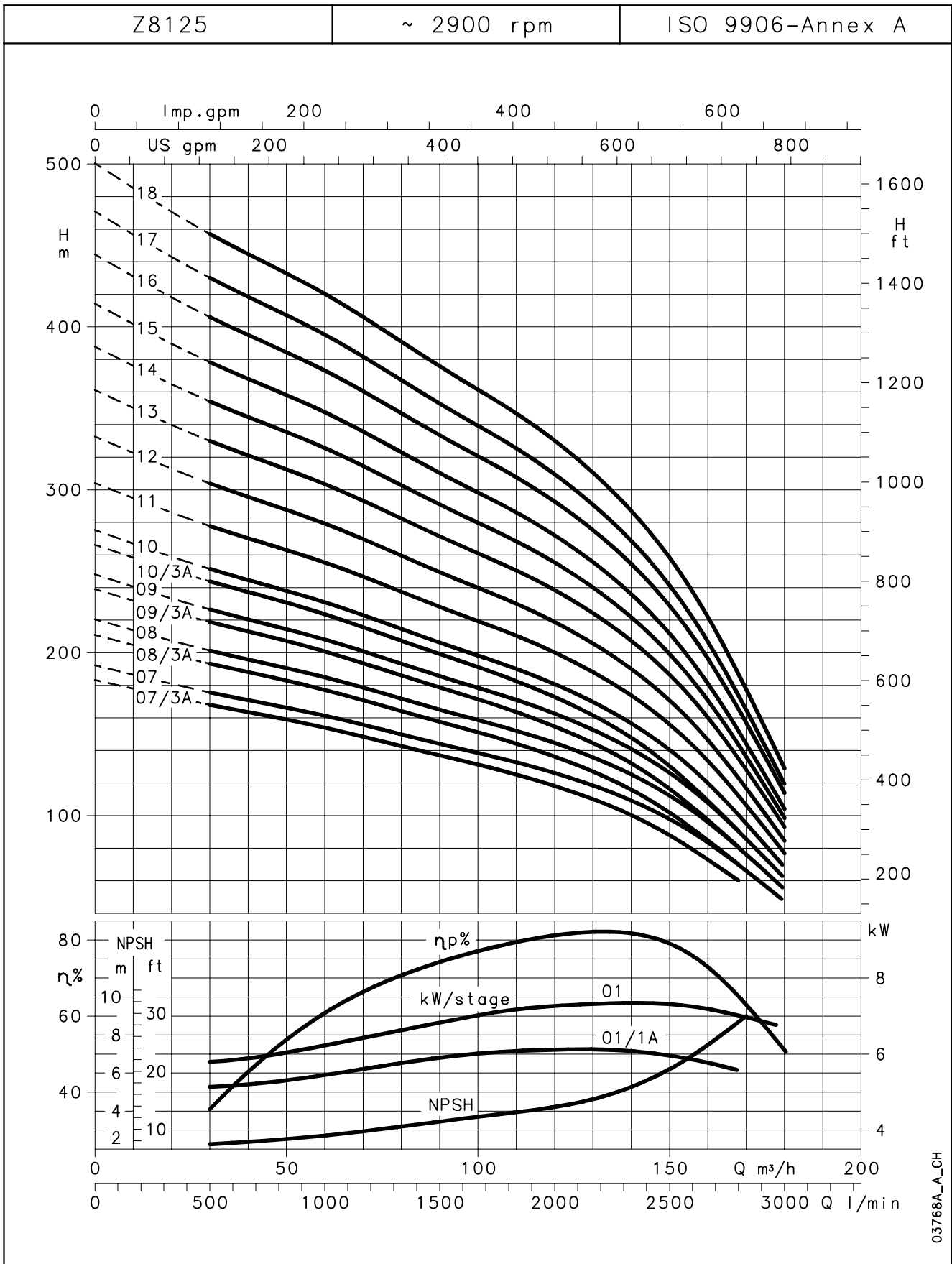
- 1) Max electric pump diameter with 2 motor cables included.  
In case of 1 motor cable C = 201,5 mm with L8W motor.  
C = 236 mm with L10W motor.
- 2) Tmin valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) Without cables.
- 4) For pumps without non-return valve, reduce dimension A by 110 mm, and reduce weight by 4 Kg.



# ITT

# Lowara

## Z8125 SERIES, 7 TO 18 STAGES OPERATING CHARACTERISTICS AT 50 Hz



03768A\_A\_CH

The flow resistance of the ΔHv non-return valve has been considered.  
 $\Delta H_v = 0,000533 \cdot Q^2$  Flow resistance = 0,35 / 0,75 / 1,35 m at 80 / 120 / 160 m³/h  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**Z855 SERIES  
DIMENSIONS AND WEIGHTS**

PUMP TYPE	MAX POWER ABSORBED BY PUMP at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg <sup>(3)</sup>
		L <sup>(3)</sup>	l	U <sub>min</sub> <sup>(2)</sup>	
Z855 01	4,6	325	235	1000	26,6
Z855 02/2A	6,4	460	235	1000	35,2
Z855 02/1A	7,7	460	235	1000	35,2
Z855 02	9,0	460	235	1000	35,2
Z855 03/2A	10,8	595	235	1000	43,9
Z855 03	13,3	595	235	1000	43,9
Z855 04/2A	15,1	730	235	1000	52,5
Z855 04	17,6	730	235	1000	52,5
Z855 05/3A	18,3	865	235	1000	61,2
Z855 05/2A	20,8	865	235	1000	61,2
Z855 05	22,0	865	235	1000	61,2
Z855 06/2A	23,9	1000	235	1000	69,8
Z855 06	26,4	1000	235	1000	69,8
Z855 07/2A	28,3	1135	235	1000	78,5
Z855 07	30,8	1135	235	1000	78,5
Z855 08/2A	32,7	1270	235	1000	87,1
Z855 08	35,2	1270	235	1000	87,1
Z855 09/2A	37,1	1405	235	1000	95,8
Z855 09	39,6	1405	235	1000	95,1
Z855 10/2A	41,5	1540	235	1000	103,8
Z855 10	44,0	1540	235	1000	103,8
Z855 11/2A	45,9	1675	235	1000	112,4
Z855 11	48,4	1675	235	1000	112,4
Z855 12	52,8	1810	235	1000	121,1
Z855 13	57,2	1945	235	1000	129,7
Z855 14	61,6	2080	235	1000	138,4
Z855 15	66,0	2215	235	1000	147
Z855 16	70,4	2350	235	1000	155,7
Z855 17	74,8	2485	235	1000	164,3
Z855 18	79,2	2620	235	1000	173
Z855 19	83,6	2755	235	1000	181,6

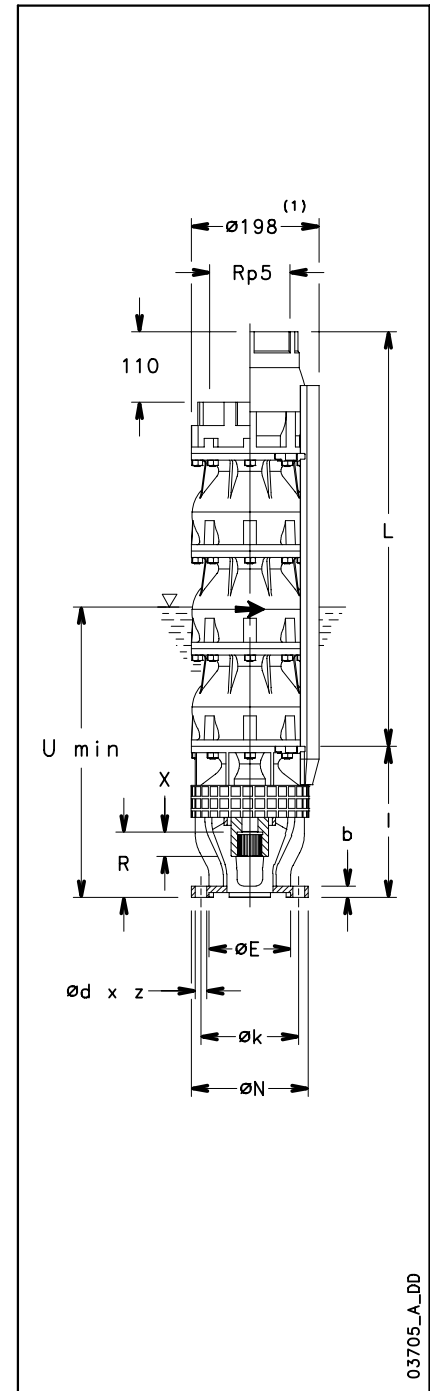
z855p-2p50-en\_a\_td

**MOTOR COUPLING**

MOTOR	DIMENSIONS (mm)							
	N	k	d	z	b	E <sup>H7</sup>	R	X
6" (NEMA)	182	111	13,5	4	17	76,16	73	24
8" (NEMA)	182	152,4	18	4	17	127	101,3	40

6" and 8" coupling according to NEMA standards

z8-mtcn-2p50-en\_a\_td



03705\_A\_DD

- 1) Max pump diameter with 1 motor cable included.
- 2) U min valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) For pumps without non-return valve, reduce dimension L by 110 mm, and reduce weight by 4 Kg.



**Z875 SERIES  
DIMENSIONS AND WEIGHTS**

PUMP TYPE	MAX POWER ABSORBED BY PUMP at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg <sup>(3)</sup>
		L <sup>(3)</sup>	l	U <sub>min</sub> <sup>(2)</sup>	
Z875 01	5,3	342	235	1000	26,9
Z875 02/2A	7,6	494	235	1000	36,2
Z875 02/1A	9,0	494	235	1000	36,2
Z875 02	10,5	494	235	1000	36,2
Z875 03/3A	11,3	646	235	1000	45,4
Z875 03/2A	12,7	646	235	1000	45,4
Z875 03/1A	14,2	646	235	1000	45,4
Z875 03	15,6	646	235	1000	45,4
Z875 04/2A	17,7	798	235	1000	54,6
Z875 04	20,6	798	235	1000	54,6
Z875 05/3A	21,5	950	235	1000	63,9
Z875 05/2A	22,9	950	235	1000	63,9
Z875 05	25,8	950	235	1000	63,9
Z875 06/2A	28,0	1102	235	1000	73,1
Z875 06/1A	29,5	1102	235	1000	73,1
Z875 06	30,9	1102	235	1000	73,1
Z875 07/2A	33,2	1254	235	1000	82,3
Z875 07	36,1	1254	235	1000	82,3
Z875 08/3A	36,9	1406	235	1000	91,5
Z875 08/2A	38,3	1406	235	1000	90,9
Z875 08	41,2	1406	235	1000	90,9
Z875 09/2A	43,5	1558	235	1000	100,1
Z875 9	46,4	1558	235	1000	100,1
Z875 10/2A	48,6	1710	235	1000	109,4
Z875 10	51,5	1710	235	1000	109,4
Z875 11/2A	53,8	1862	235	1000	118,6
Z875 11	56,7	1862	235	1000	118,6
Z875 12	61,8	2014	235	1000	127,8
Z875 13	67,0	2166	235	1000	137
Z875 14	72,1	2318	235	1000	146,3
Z875 15	77,3	2470	235	1000	155,5
Z875 16	82,4	2622	235	1000	164,7
Z875 17	87,6	2774	235	1000	174
Z875 18	92,7	2926	256	1000	183,2

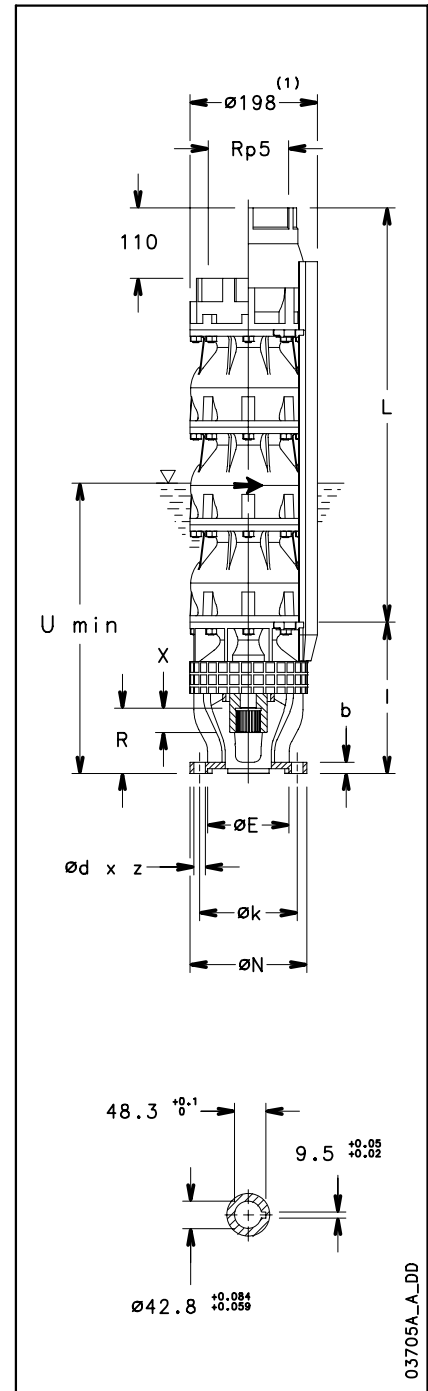
z875p-2p50-en\_a\_td

**MOTOR COUPLING**

MOTOR	DIMENSIONS (mm)							
	N	k	d	z	b	E <sup>H7</sup>	R	X
6" (NEMA)	182	111	13,5	4	17	76,16	73	24
8" (NEMA)	182	152,4	18	4	17	127	101,3	40
10"	232	190,5	M16	4	21	127	101,3	84

6" and 8" coupling according to NEMA standards

z8a-mtcn-2p50-en\_a\_td



- 1) Max pump diameter with 1 motor cable included.
- 2) U<sub>min</sub> valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) For pumps without non-return valve, reduce dimension L by 110 mm, and reduce weight by 4 Kg.

**Z895 SERIES  
DIMENSIONS AND WEIGHTS**

PUMP TYPE	MAX POWER ABSORBED BY PUMP at 2900 min <sup>-1</sup> kW	DIMENSIONS (mm)			WEIGHT kg <sup>(3)</sup>
		L <sup>(3)</sup>	l	U <sub>min</sub> <sup>(2)</sup>	
Z895 01	7,7	342	235	1000	26,9
Z895 02/2B	10,0	494	235	1000	36,2
Z895 02/2A	12,8	494	235	1000	36,2
Z895 02	15,2	494	235	1000	36,2
Z895 03/2B	17,4	646	235	1000	45,4
Z895 03/1A	21,4	646	235	1000	45,4
Z895 03	22,5	646	235	1000	45,4
Z895 04/2B	24,6	798	235	1000	54,6
Z895 04/2A	27,4	798	235	1000	54,6
Z895 04	29,8	798	235	1000	54,6
Z895 05/3A	33,7	950	235	1000	63,9
Z895 05	37,2	950	235	1000	63,9
Z895 06/3A	41,1	1102	235	1000	73,1
Z895 06	44,6	1102	235	1000	73,1
Z895 07/3A	48,6	1254	235	1000	81,7
Z895 07	52,1	1254	235	1000	81,7
Z895 08/3A	56,0	1406	235	1000	90,9
Z895 08	59,5	1406	235	1000	90,9
Z895 09/3A	63,5	1558	235	1000	100,1
Z895 09	67,0	1558	235	1000	100,1
Z895 10/3A	70,9	1710	235	1000	109,4
Z895 10	74,4	1710	235	1000	109,4
Z895 11	81,8	1862	235	1000	118,6
Z895 12	89,3	2014	235	1000	127,8
Z895 13	96,7	2166	256	1000	137
Z895 14	104,2	2318	256	1000	146,3
Z895 15	111,6	2470	256	1000	155,5
Z895 16	119,0	2622	256	1000	164,7
Z895 17	126,5	2774	256	1000	174
Z895 18	133,9	2926	256	1000	183,2

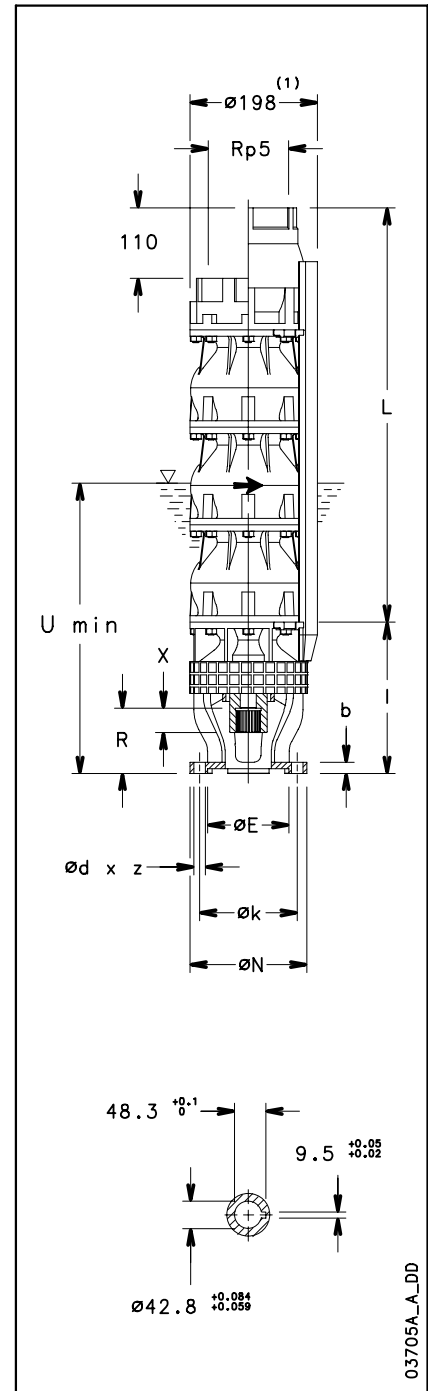
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**MOTOR COUPLING**

MOTOR	DIMENSIONS (mm)							
	N	k	d	z	b	E <sup>H7</sup>	R	X
6" (NEMA)	182	111	13,5	4	17	76,16	73	24
8" (NEMA)	182	152,4	18	4	17	127	101,3	40
10"	232	190,5	M16	4	21	127	101,3	84

6" and 8" coupling according to NEMA standards

z8a-mtcn-2p50-en\_a\_td



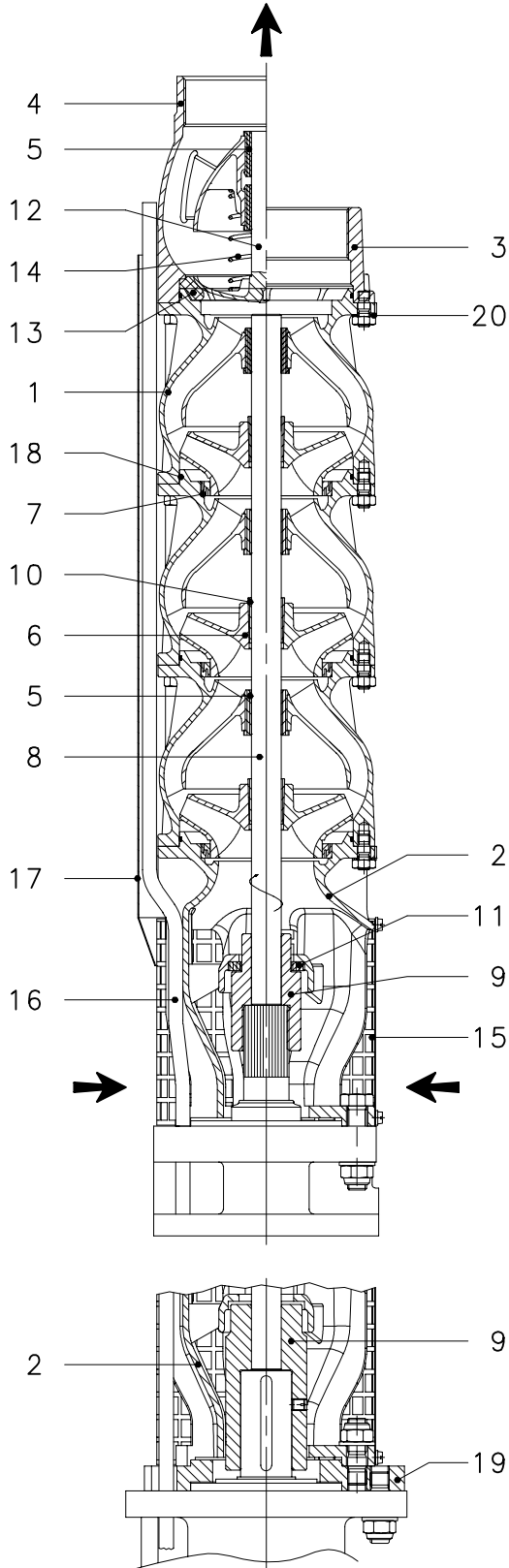
- 1) Max pump diameter with 1 motor cable included.
- 2) U<sub>min</sub> valid only for max flow speed of 4,2 m/s.  
For higher speeds please contact our sales network.
- 3) For pumps without non-return valve, reduce dimension L by 110 mm, and reduce weight by 4 Kg.





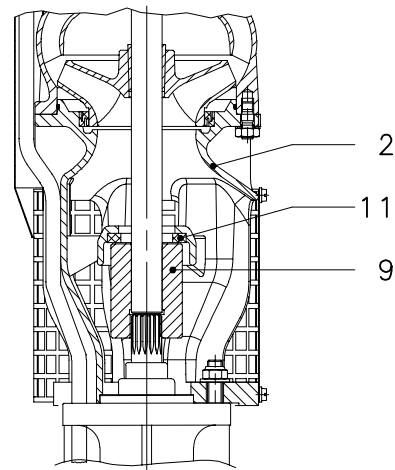
## Z8 SERIES PUMPS

### PUMP CROSS SECTION AND LIST OF COMPONENTS



REF. N.	DESCRIPTION
1	Stage casing
2	Suction casing
3	Delivery casing
4	Valve body
5	Bearing bush
6	Impeller
7	Wear ring
8	Shaft
9	Coupling
10	Locking sleeve
11	Thrust bearing
12	Wing valve
13	Valve seat
14	Valve spring
15	Suction strainer
16	Motor cable
17	Cable guard
18	O-ring
19	10" Motor adapter
20	Clamplng plate

z8-2p50-en\_a\_tp



## 6" Submersible motors

Submersible canned motors. The choice of component materials ensures optimum operating performances, superior quality, reliability and ease of installation.

## L6C Series



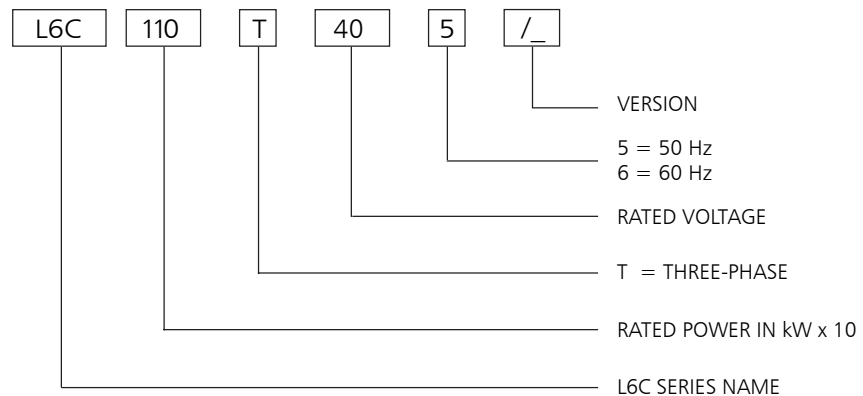
### SPECIFICATIONS

- **Stainless steel** outer sleeve.
- Shaft extension and coupling dimensions to **NEMA** standards.
- Class **F insulation**.
- Protection class: **IP68**.
- Compensating bellows for internal liquid expansion.
- Axial load supported by Kingsbury type thrust bearing.
- **Mechanical seal** protected by sand guard.
- Maximum **immersion depth**: 250 m.
- Maximum **number of starts per hour** at regular intervals: 25 for direct start.
- Maximum supply **voltage variations** allowed:  $\pm 10\%$ .
- Maximum water **temperature**: 35°C.  
Max. temperature applies to motors working in an installation capable of delivering a flow of water around the motor jacket of at least 0,2 m/s.
- **Axial thrust**:  
16000 N from 4 to 22 kW;  
27000 N from 30 to 37 kW.
- **Extractable supply cable** fitted with watertight connector.
- **Versions**:  
- Three-phase:  
4 to 22 kW 220-240 V, 50 Hz.  
4 to 37 kW 380-415 V, 50 Hz.
- Motors with double cable outlet for star/delta start can be supplied upon request.
- Can also operate in horizontal position, provided that the associated pump can apply an axial thrust of at least 250 N on the entire operating field.
- Screws included.

### OPTIONAL FEATURES

- Silicon Carbide mechanical seal.
- Special voltages.
- Inverter applications.
- PT100 temperature sensor.

### IDENTIFICATION CODE

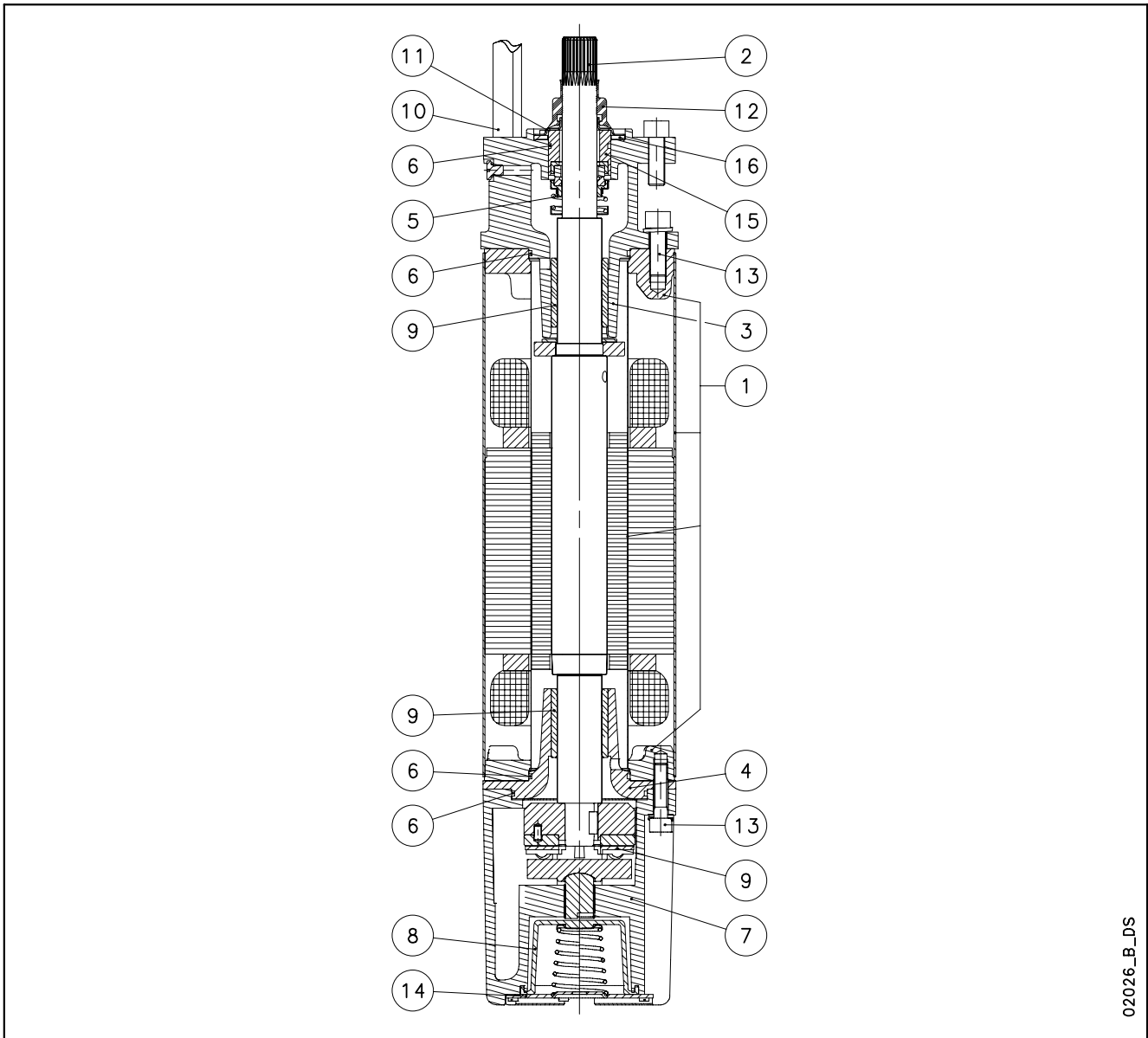


EXAMPLE : L6C110T405

L6C MOTOR :  
RATED POWER 11 kW; THREE-PHASE;  
RATED VOLTAGE 400 V; 50 Hz

**High starting torque**

**Power supply cable with extractable connector**

**L6C SERIES MOTORS  
MOTOR CROSS SECTION AND TABLE OF MATERIALS**


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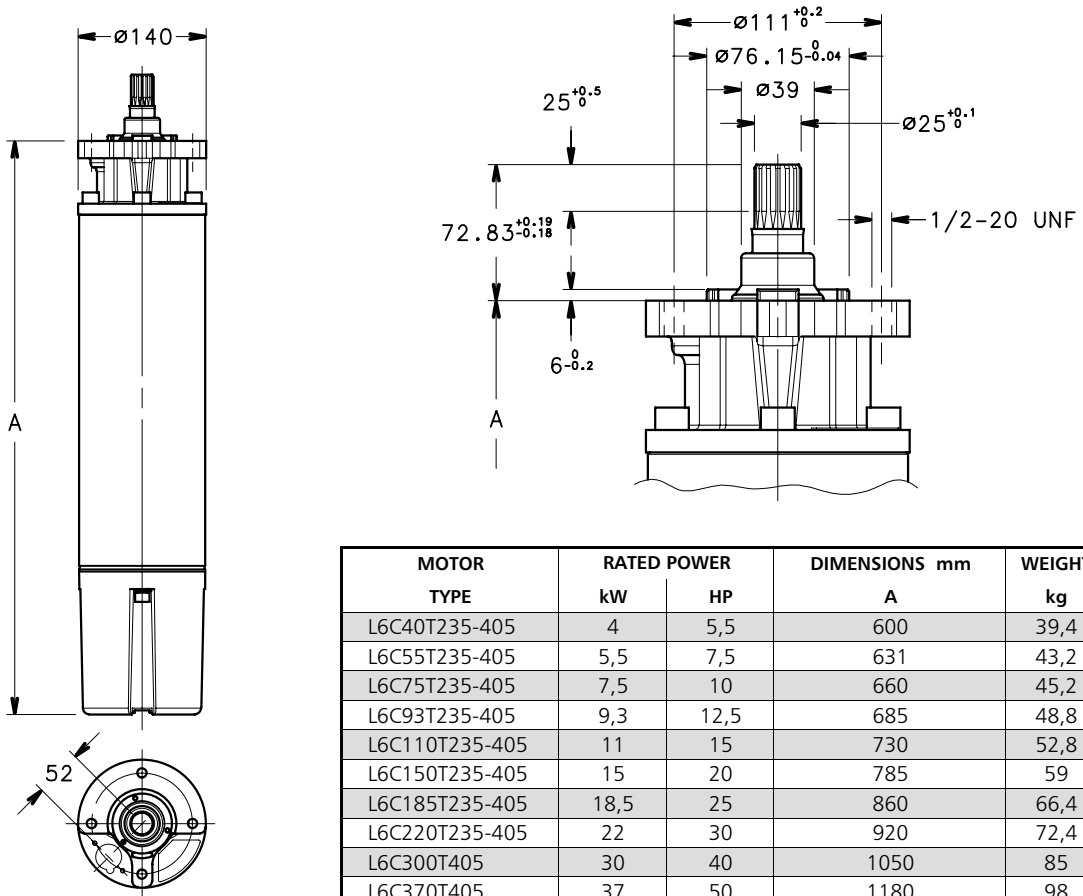
REF. N°	PART	MATERIAL	DESIGNATION	
			EUROPE	USA
1	Inner and outer sleeve	Stainless steel	EN 10088-1-X2CrNi18-9 (1.4307)	AISI304L
	Flange	Carbon steel	EN 10025 - S355JR (Fe 510-B)	ASTM A105
2	Shaft extension	Stainless steel (Duplex)	EN 10095 X3CrNiMoN27-5-2 (1.4460)	AISI329
3	Upper bracket	Cast iron	EN-GJL-200	Class 25 B
4	Intermediate bracket	Cast iron	EN-GJL-200	Class 25 B
5	Mechanical seal	Carbon graphite / Aluminium oxide		
6	Elastomers	NBR		
7	Lower bracket	Cast iron	EN-GJL-200	Class 25 B
8	Compensating bellows	NBR		
9	Bearings	Carbon-graphite		
10	Cable	EPDM		
11	Fixed sand guard	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
12	Removable sand guard	NBR		
13	Bolts and screws	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
14	Lower cover	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
15	Mechanical seal spacer	A105 nichel plated		
16	Sand guard gasket	CR neoprene		
	Cooling liquid	Demineralized water + antifreeze		



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## L6C SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz



MOTOR TYPE	RATED POWER		DIMENSIONS mm	WEIGHT
	kW	HP	A	kg
L6C40T235-405	4	5,5	600	39,4
L6C55T235-405	5,5	7,5	631	43,2
L6C75T235-405	7,5	10	660	45,2
L6C93T235-405	9,3	12,5	685	48,8
L6C110T235-405	11	15	730	52,8
L6C150T235-405	15	20	785	59
L6C185T235-405	18,5	25	860	66,4
L6C220T235-405	22	30	920	72,4
L6C300T405	30	40	1050	85
L6C370T405	37	50	1180	98

l6c-2p50-en\_d\_td

02027\_B\_DD

**L6C SERIES MOTORS  
THREE-PHASE OPERATING CHARACTERISTICS AT 50 Hz**

MOTOR TYPE	RATED POWER		RATED VOLTAGE V	OPERATING CHARACTERISTICS AT RATED POWER				DIRECT START		MAX WATER TEMPERATURE °C	CABLE TYPE	
	kW	HP		RATED CURRENT A	rpm	η %	cosφ	Ts/Tn*	Is/In		Nc x sec mm <sup>2</sup>	L m
L6C40T235	4	5,5	220	17,8	2825	75	0,8	1,7	3,9	35	4x4	4
			230	18,4	2845	74	0,75	1,7	3,9			
			240	19,1	2860	74	0,7	1,7	3,8			
L6C55T235	5,5	7,5	220	24,1	2820	77	0,8	1,8	3,8	35	4x4	4
			230	24,2	2845	76	0,75	1,8	3,8			
			240	25,3	2860	76	0,71	1,8	3,6			
L6C75T235	7,5	10	220	30,5	2820	78	0,82	2	3,9	35	4x4	4
			230	31,2	2840	77	0,78	2	3,9			
			240	31,7	2850	77	0,73	2	4			
L6C93T235	9,3	12,5	220	37,6	2820	78	0,82	2,1	3,8	35	4x6	4
			230	38,1	2840	79	0,8	2,1	3,9			
			240	39,5	2850	78	0,79	2,15	3,9			
L6C110T235	11	15	220	43,3	2815	77	0,87	2,1	4,5	35	4x6	4
			230	44,2	2840	78	0,82	2,1	4,5			
			240	45,0	2845	77	0,79	2,15	4,5			
L6C150T235	15	20	220	58,0	2810	80	0,84	2,2	4,1	35	4x8	4
			230	57,9	2840	81	0,8	2,2	4,1			
			240	59,2	2850	81	0,76	2,25	4,1			
L6C185T235	18,5	25	220	70,1	2820	81	0,83	2,3	4,3	35	4x8	4
			230	71,0	2845	82	0,8	2,3	4,3			
			240	72,7	2855	82	0,73	2,35	4,3			
L6C220T235	22	30	220	82,3	2810	81	0,88	2,3	4	35	4x8	4
			230	81,4	2825	82	0,84	2,3	4,1			
			240	82,3	2835	82	0,8	2,35	4,2			
L6C40T405	4	5,5	380	10,3	2825	75	0,8	1,7	3,9	35	4x4	4
			400	10,6	2845	74	0,75	1,7	3,9			
			415	11	2860	74	0,7	1,7	3,8			
L6C55T405	5,5	7,5	380	13,9	2820	77	0,8	1,8	3,8	35	4x4	4
			400	14	2845	76	0,75	1,8	3,8			
			415	14,6	2860	76	0,71	1,8	3,6			
L6C75T405	7,5	10	380	17,6	2820	78	0,82	2	3,9	35	4x4	4
			400	18	2840	77	0,78	2	3,9			
			415	18,3	2850	77	0,73	2	4			
L6C93T405	9,3	12,5	380	21,7	2820	78	0,82	2,1	3,8	35	4x4	4
			400	22	2840	79	0,8	2,1	3,9			
			415	22,8	2850	78	0,79	2,15	3,9			
L6C110T405	11	15	380	25	2815	77	0,87	2,1	4,5	35	4x4	4
			400	25,5	2840	78	0,82	2,1	4,5			
			415	26	2845	77	0,79	2,15	4,5			
L6C150T405	15	20	380	33,5	2810	80	0,84	2,2	4,1	35	4x4	4
			400	33,4	2840	81	0,8	2,2	4,1			
			415	34,2	2850	81	0,76	2,25	4,1			
L6C185T405	18,5	25	380	40,5	2820	81	0,83	2,3	4,3	35	4x6	4
			400	41	2845	82	0,8	2,3	4,3			
			415	42	2855	82	0,73	2,35	4,3			
L6C220T405	22	30	380	47,5	2810	81	0,88	2,3	4	35	4x6	4
			400	47	2825	82	0,84	2,3	4,1			
			415	47,5	2835	82	0,8	2,35	4,2			
L6C300T405	30	40	380	63	2810	82	0,89	2,4	4	35	4x8	4
			400	61,5	2830	82	0,85	2,4	4,1			
			415	63,5	2840	81	0,8	2,45	3,9			
L6C370T405	37	50	380	79,5	2820	82	0,87	2	3,7	35	4x8	4
			400	79,3	2830	81	0,84	2,2	3,9			
			415	80	2840	81	0,8	2,3	4			

\* Ts/Tn = ratio between starting torque and nominal torque.

l6c-2p50-en\_f\_te



## 6" Submersible motors

Water filled submersible motors. The choice of component materials ensures optimum operating performances, superior quality, reliability and ease of installation.

### L6W Series



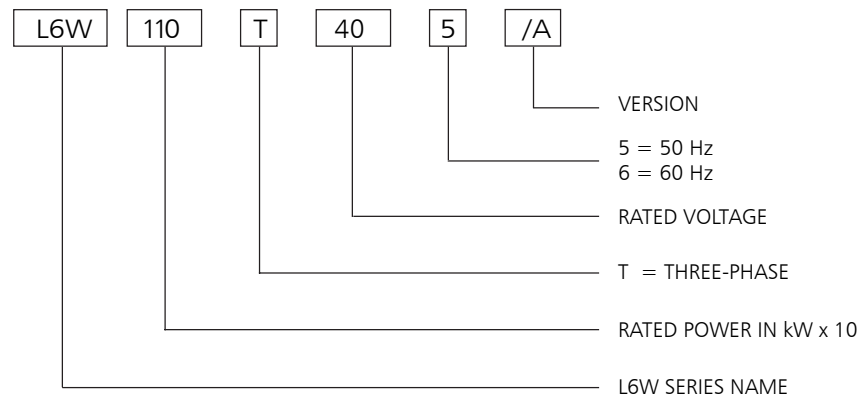
#### SPECIFICATIONS

- **Stainless steel** outer sleeve.
- Shaft extension and coupling dimensions to **NEMA** standards.
- **Rewindable stator** with insulated PVC winding.
- Class **Y insulation**.
- Protection class: **IP68**.
- Compensating bellows for internal liquid expansion.
- Axial load supported by Kingsbury type thrust bearing.
- **Mechanical seal** protected by sand guard.
- Maximum **immersion depth**: 350 m.
- Maximum **number of starts per hour** at regular intervals: 15.
- Maximum supply **voltage variations** allowed :  $\pm 10\%$ .
- Maximum water **temperature**: 25°C.  
Max. temperature applies to motors working in a installation capable of delivering a flow of water around the motor jacket of at least 0,2 m/s (0,5 m/s for 37 kW).
- **Axial thrust**:  
16000 N from 4 to 22 kW;  
30000 N from 26 to 37 kW.
- **Power supply** cable suitable for drinkable water.
- **Versions**:  
- Three-phase:  
4 to 37 kW 380-415 V, 50 Hz.
- Motors with double cable outlet for star/delta start can be supplied upon request.
- All versions can operate in horizontal position, provided the impeller axial thrust is from the pump to the motor.
- Screws included.

#### OPTIONAL FEATURES

- Silicon Carbide mechanical seal.
- Special voltages.
- High temperature windings.
- Inverter applications.
- PT 100 temperature sensor.

#### IDENTIFICATION CODE



EXAMPLE : L6W110T405/A

L6W MOTOR :  
RATED POWER 11 kW; THREE-PHASE;  
RATED VOLTAGE 400 V; 50 Hz; /A VERSION

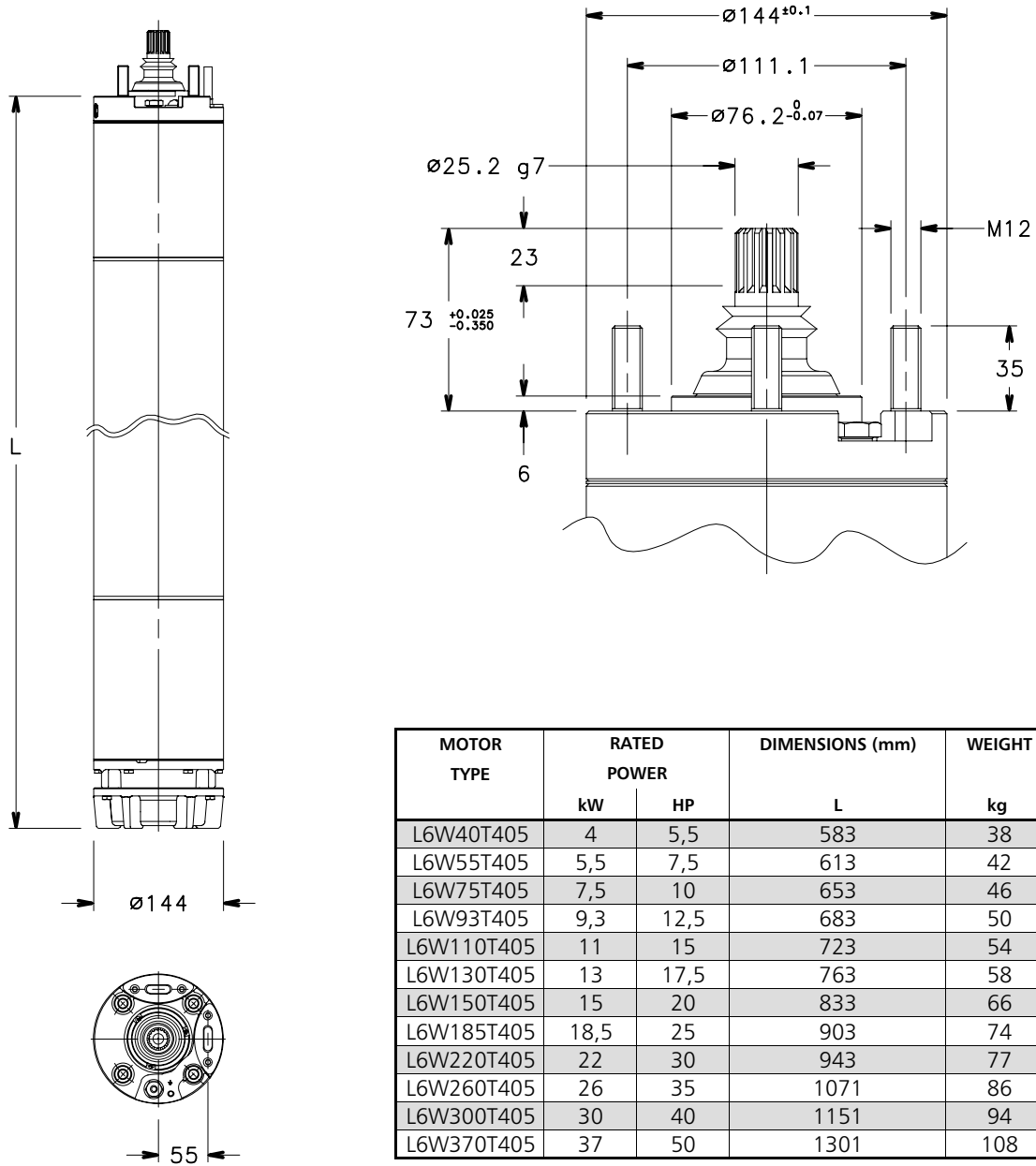
- Rewindable stator**
- Thrust bearing Kingsbury type**
- Mechanical seal**



# ITT

# Lowara

## L6W SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz



MOTOR TYPE	RATED POWER		DIMENSIONS (mm)	WEIGHT
	kW	HP	L	kg
L6W40T405	4	5,5	583	38
L6W55T405	5,5	7,5	613	42
L6W75T405	7,5	10	653	46
L6W93T405	9,3	12,5	683	50
L6W110T405	11	15	723	54
L6W130T405	13	17,5	763	58
L6W150T405	15	20	833	66
L6W185T405	18,5	25	903	74
L6W220T405	22	30	943	77
L6W260T405	26	35	1071	86
L6W300T405	30	40	1151	94
L6W370T405	37	50	1301	108

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# ITT

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## L6W SERIES MOTORS THREE-PHASE OPERATING CHARACTERISTICS AT 50 Hz

MOTOR TYPE	RATED POWER		RATED VOLTAGE	OPERATING CHARACTERISTICS AT RATED POWER				DIRECT START		MAX WATER TEMPERATURE	CABLE TYPE			
				THREE-PHASE	kW	HP	RATED CURRENT	rpm	$\eta$ %		cos $\phi$	Ts/Tn*	Is/In	Sec. (mm <sup>2</sup> )
	A	DOL												Y/D
L6W40T405	4	5,5	380	9,62	2845	69,5	0,91	0,96	3,64	25	4	-	4	
			415	8,94	2880	72,2	0,86	1,15	4,27					
L6W55T405	5,5	7,5	380	12,7	2850	74,0	0,89	1,28	4,27	25	4	4	4	
			415	12,3	2885	74,7	0,83	1,54	4,82					
L6W75T405	7,5	10	380	17,1	2830	74,4	0,9	1,18	4,07	25	4	4	4	
			415	16,4	2865	75,7	0,84	1,43	4,65					
L6W93T405	9,3	12,5	380	20,5	2835	76,6	0,89	1,51	4,57	25	4	4	4	
			415	19,8	2870	77,6	0,83	1,82	5,16					
L6W110T405	11	15	380	24,8	2825	76,3	0,89	1,36	4,27	25	4	4	4	
			415	24,0	2860	77,4	0,82	1,64	4,81					
L6W130T405	13	17,5	380	28,7	2820	76,6	0,9	1,37	4,38	25	4	4	4	
			415	27,5	2860	77,9	0,84	1,66	4,99					
L6W150T405	15	20	380	32,4	2830	76,1	0,89	1,62	4,83	25	4	4	4	
			415	31,1	2865	80,3	0,84	1,96	5,48					
L6W185T405	18,5	25	380	40,0	2835	80,3	0,87	1,80	5,10	25	6	4	4	
			415	39,6	2865	80,4	0,81	2,17	5,63					
L6W220T405	22	30	380	48,5	2835	78,7	0,88	1,05	4,59	25	6	4	4	
			415	45,4	2875	81,8	0,82	1,26	5,30					
L6W260T405	26	35	380	56,2	2865	80,2	0,88	1,03	4,57	25	6	4	4	
			415	53,4	2890	81,9	0,83	1,24	5,25					
L6W300T405	30	40	380	64,7	2855	80,5	0,88	1,08	4,59	25	10	4	4	
			415	61,4	2885	82,1	0,83	1,30	5,28					
L6W370T405	37	50	380	81,7	2840	78,6	0,88	1,00	4,24	20	10	4	4	
			415	78,8	2875	79,8	0,82	1,20	4,81					

\* Ts/Tn = ratio between starting torque and nominal torque.

l6w-2p50-en\_c\_te



**Lowara**

## 8" Submersible motors

Water filled submersible motors. The choice of component materials ensures optimum operating performances, superior quality, reliability and ease of installation.

### L8W Series



**Rewindable stator**

**Thrust bearing Kingsbury type**

**Mechanical seal**

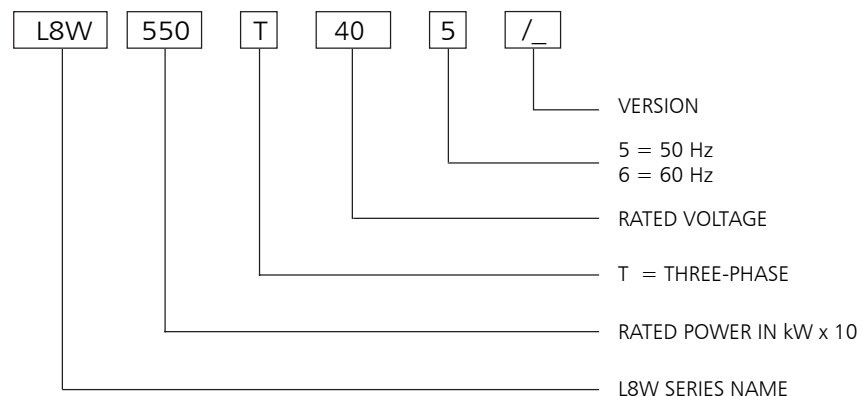
### SPECIFICATIONS

- **Stainless steel** outer sleeve.
- Shaft extension and coupling dimensions to **NEMA** standards.
- **Rewindable stator** with insulated PVC winding.
- Class **Y insulation**.
- Protection class: **IP68**.
- Compensating bellows for internal liquid expansion.
- Axial load supported by Kingsbury type thrust bearing.
- **Mechanical seal** protected by sand guard.
- Maximum **immersion depth**: 350 m.
- Maximum **number of starts per hour** at regular intervals: 10.
- Maximum supply **voltage variations** allowed :  $\pm 10\%$ .
- Maximum water **temperature**: 25°C.  
Max. temperature applies to motors working in a installation capable of delivering a flow of water around the motor jacket of at least 0,5 m/s.
- **Axial thrust**: 50000 N from 30 to 93 kW.
- **Power supply** cable suitable for drinkable water.
- **Versions**:  
- Three-phase:  
30 to 93 kW 380-415 V, 50 Hz.
- Motors with double cable outlet for star/delta start can be supplied upon request.

### OPTIONAL FEATURES

- Silicon Carbide mechanical seal.
- Special voltages.
- Horizontal installation.
- High temperature windings.
- Inverter applications.
- PT 100 temperature sensor.

### IDENTIFICATION CODE



EXAMPLE : L8W550T405

L8W MOTOR :  
RATED POWER 55 kW; THREE-PHASE;  
RATED VOLTAGE 400 V; 50 Hz



# ITT

# Lowara

## L8W SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz

MOTOR TYPE	RATED POWER		DIMENSIONS (mm)		WEIGHT
	kW	HP	L	kg	
L8W300T405	30	40	1015	145	
L8W370T405	37	50	1105	162	
L8W450T405	45	60	1195	180	
L8W520T405	52	70	1285	200	
L8W550T405	55	75	1325	206	
L8W600T405	60	80	1375	217	
L8W670T405	67	90	1465	235	
L8W750T405	75	100	1555	252	
L8W830T405	83	110	1615	265	
L8W930T405	93	125	1755	290	

03550\_A\_DD  
l8w-2p50-en\_a\_td

## OPERATING CHARACTERISTICS AT 50 Hz

MOTOR TYPE	RATED POWER		RATED VOLTAGE	OPERATING CHARACTERISTICS AT RATED POWER				DIRECT START		MAX WATER TEMPERATURE	CABLE TYPE		
	THREE-PHASE	kW		HP	RATED CURRENT	rpm	$\eta$ %	$\cos\phi$	$T_s/T_n^*$		$I_s/I_n$	Sec. (mm <sup>2</sup> )	
			V	A						°C	DOL	Y/D	L (m)
L8W300T405	30	40	380	65	2905	83,0	0,85	1,20	4,67	25	10	6	5,5
			415	59	2900	83,0	0,84	1,09	4,70				
L8W370T405	37	50	380	81	2840	80,5	0,87	1,04	4,19	25	10	6	5,5
			415	76	2870	81,5	0,83	1,23	4,88				
L8W450T405	45	60	380	92	2850	82,0	0,87	0,92	3,72	25	16	6	5,5
			415	88,5	2880	83,5	0,83	1,09	4,23				
L8W520T405	52	70	380	110	2840	82,0	0,86	1,14	3,90	25	16	6	5,5
			415	104	2885	82,5	0,82	1,16	4,50				
L8W550T405	55	75	380	118	2840	82,0	0,87	1,26	3,57	25	16	10	5,5
			415	110	2885	82,5	0,83	1,27	4,19				
L8W600T405	60	80	380	124	2855	82,0	0,87	1,12	4,18	25	16	10	5,5
			415	118	2885	83,5	0,83	1,33	4,80				
L8W670T405	67	90	380	138	2850	82,5	0,88	0,98	4,22	25	25	10	5,5
			415	132	2885	83,5	0,83	1,16	4,82				
L8W750T405	75	100	380	156	2860	82,0	0,87	0,92	4,10	25	25	16	5,5
			415	148	2885	83,0	0,82	1,10	4,72				
L8W830T405	83	110	380	172	2860	83,0	0,87	0,91	4,12	25	35	16	5,5
			415	163	2880	84,0	0,82	1,08	4,66				
L8W930T405	93	125	380	192	2850	83,0	0,87	0,84	3,38	25	35	16	5,5
			415	180	2885	84,0	0,83	1,00	4,30				

\*  $T_s/T_n$  = ratio between starting torque and nominal torque.

## 10" Submersible motors

Water filled submersible motors. The choice of component materials ensures optimum operating performances, superior quality, reliability and ease of installation.

### L10W Series



#### SPECIFICATIONS

- **Stainless steel** outer sleeve.
- **Rewindable stator** with insulated PVC winding.
- Class **Y insulation**.
- Protection class: **IP68**.
- Compensating bellows for internal liquid expansion.
- Axial load supported by Kingsbury type thrust bearing.
- **Mechanical seal** protected by sand guard.
- Maximum **immersion depth**: 350 m.
- Maximum **number of starts per hour** at regular intervals: 8.
- Maximum supply **voltage variations** allowed :  $\pm 10\%$ .
- Maximum water **temperature**: 25°C.

Max. temperature applies to motors working in a installation capable of delivering a flow of water around the motor jacket of at least 0,5 m/s.

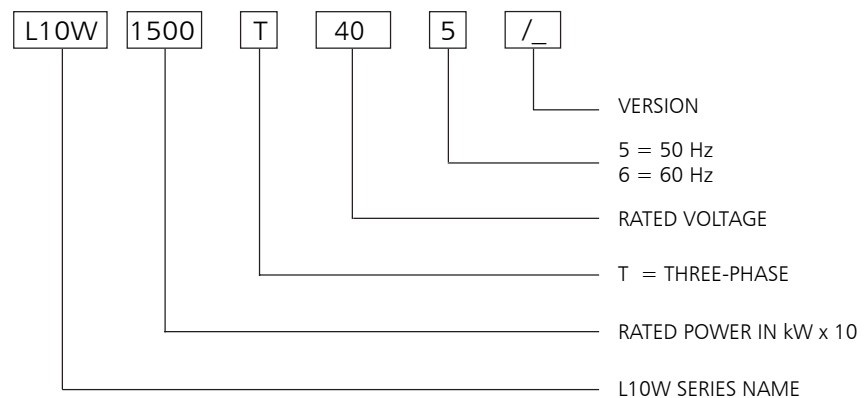
- **Axial thrust**: 65000 N from 93 to 150 kW.
- **Power supply** cable suitable for drinkable water.
- **Versions**:
  - Three-phase: 93 to 150 kW 380-415 V, 50 Hz.
- Motors with double cable outlet for star/delta start can be supplied upon request.

#### OPTIONAL FEATURES

- Silicon Carbide mechanical seal.
- Special voltages.
- Horizontal installation.
- High temperature windings.
- Inverter applications.
- PT 100 temperature sensor.

- Rewindable stator**
- Thrust bearing Kingsbury type**
- Mechanical seal**

#### IDENTIFICATION CODE



EXAMPLE : L10W1500T405

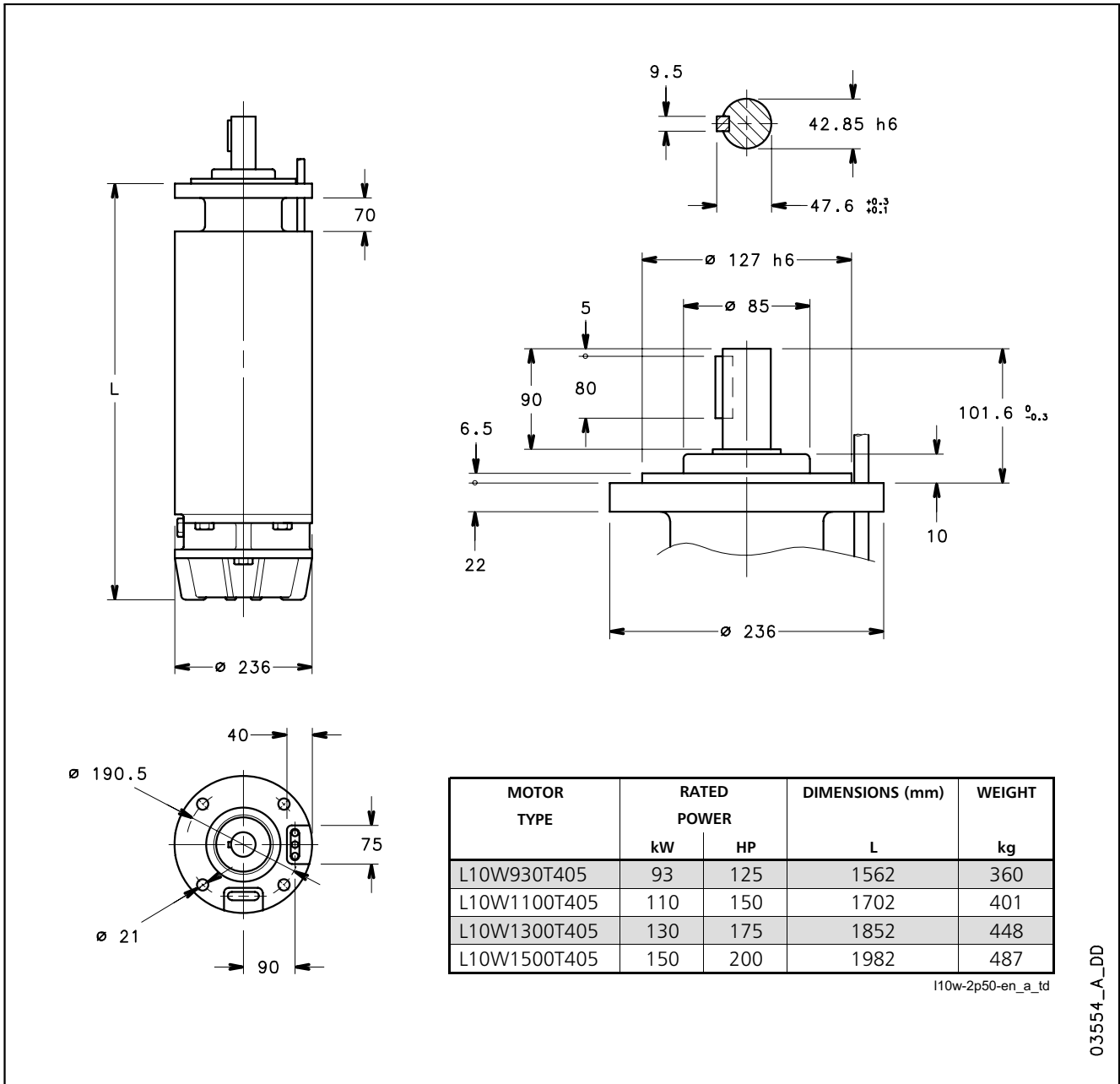
L10W MOTOR :  
RATED POWER 150 kW; THREE-PHASE;  
RATED VOLTAGE 400 V; 50 Hz



# ITT

# Lowara

## L10W SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz



## OPERATING CHARACTERISTICS AT 50 Hz

MOTOR TYPE	RATED POWER		RATED VOLTAGE	OPERATING CHARACTERISTICS AT RATED POWER					DIRECT START		MAX WATER TEMPERATURE	CABLE TYPE		
	kW	HP		A	rpm	η %	cosφ	Ts/Tn*	Is/In	Sec. (mm <sup>2</sup> )				
										DOL		Y/D	L (m)	
L10W930T405	93	125	191	2895	83,0	0,87	1,02	5,14	25	35	25	5		
			180	2915	84,0	0,84	1,21	5,95						
L10W1100T405	110	150	235	2900	83,5	0,86	1,20	4,77	25	50	25	5		
			220	2920	84,5	0,82	1,43	5,57						
L10W1300T405	130	175	270	2895	84,0	0,86	1,29	4,84	25	50	25	5		
			255	2915	85,5	0,83	1,54	5,60						
L10W1500T405	150	200	308	2905	83,0	0,86	1,26	4,77	25	70	25	5		
			285	2925	84,0	0,84	1,50	5,63						

\* Ts/Tn = ratio between starting torque and nominal torque.



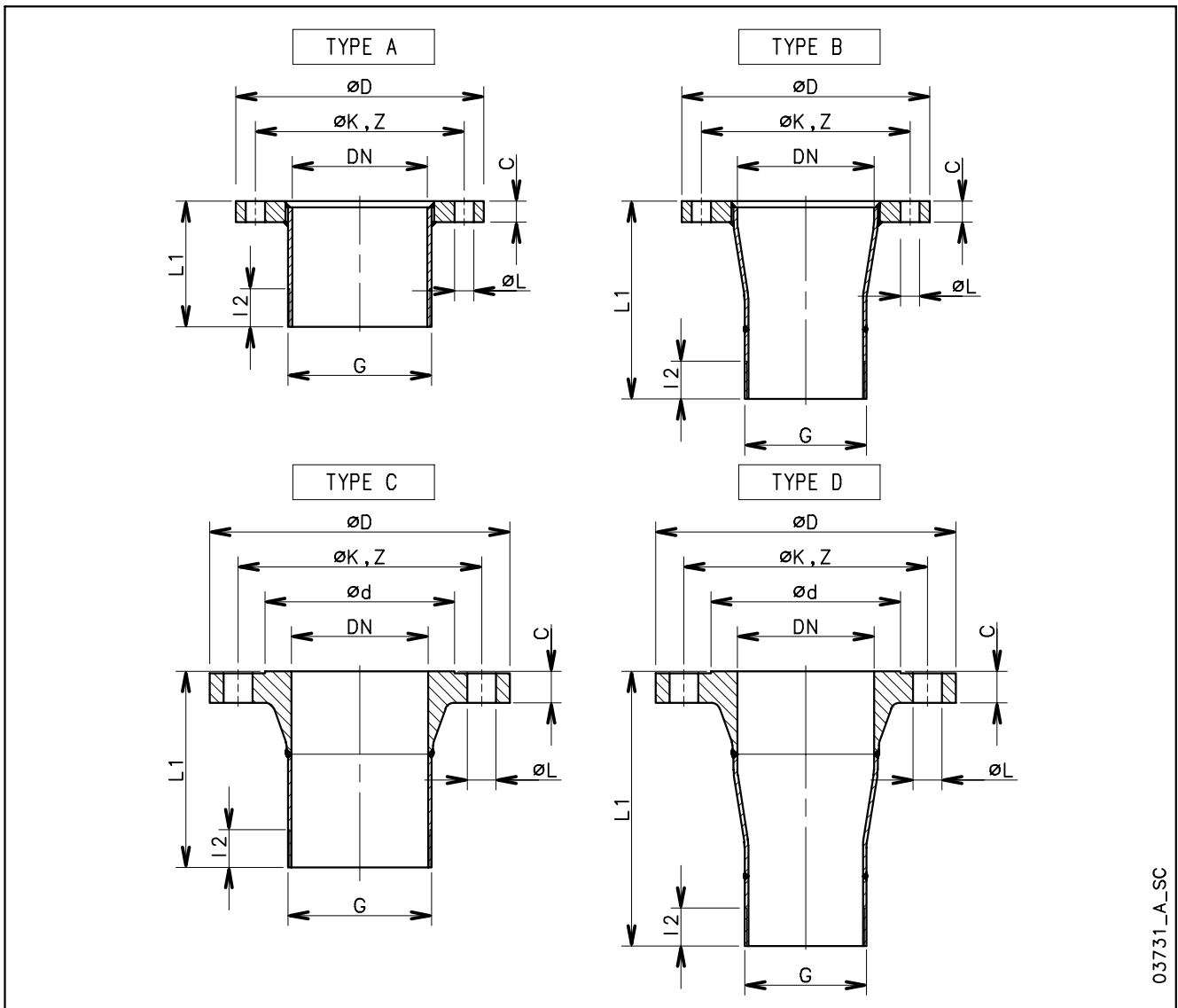


## ACCESSORIES

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## ISO-THREADED FLANGES



03731\_A\_SC

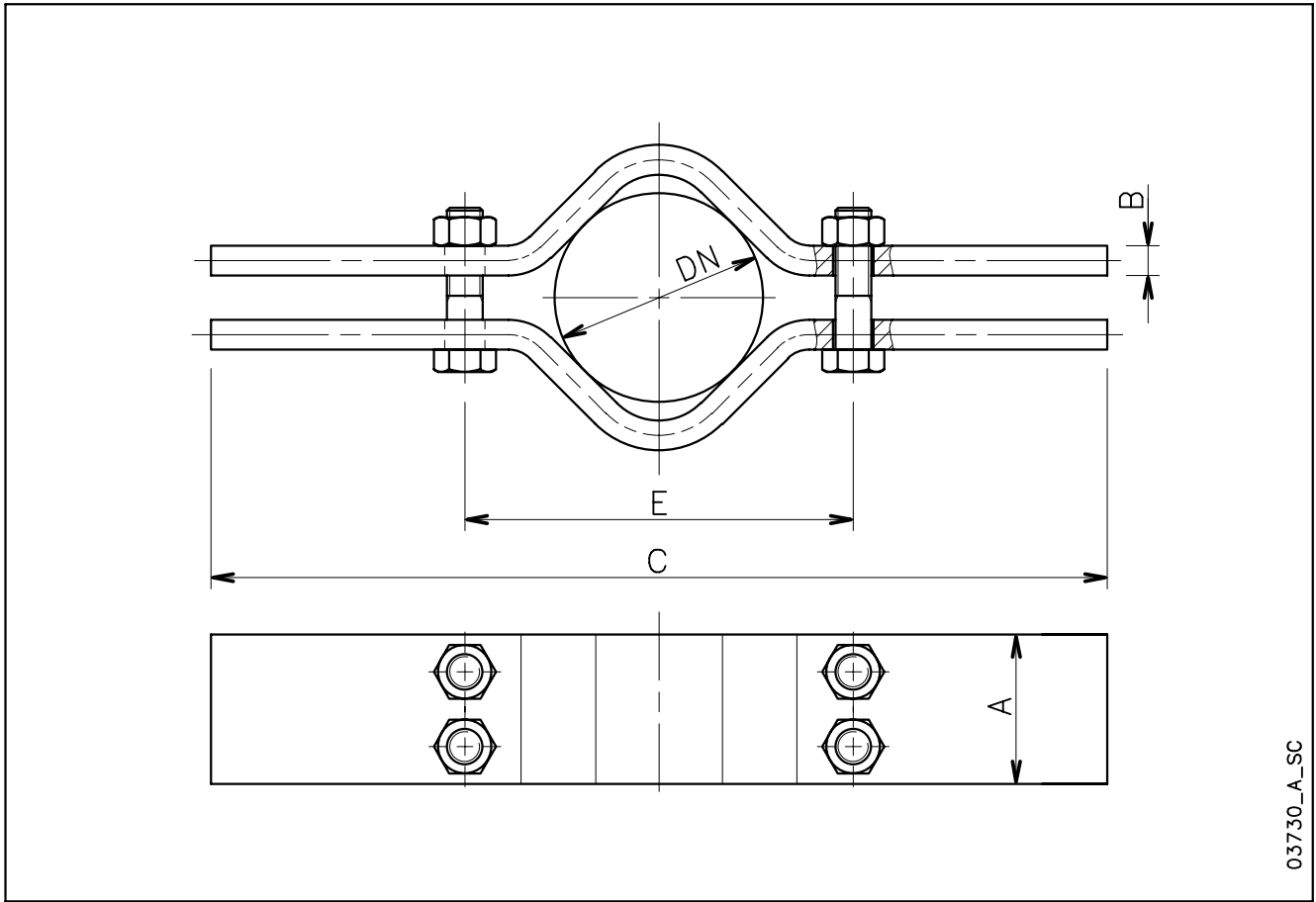
PUMP TYPE	THREADING ISO 7-1 G	Dimensions (mm)											
		* Flange according to EN 1092-1									L1	I2	TYPE
		DN	PN	$\varnothing D$	$\varnothing d$	$\varnothing K$	Z	$\varnothing L$	C				
Z855 Z875 Z895 Z8125	R 5	125	10 ÷ 16	250	-	210	8	18	22	108	44	A	
		125	25 ÷ 40	270	188	220	8	26	26	168	44	C	
		125	63	295	188	240	8	30	34	188	44	C	
		150	10 ÷ 16	285	-	240	8	22	22	248	44	B	
		150	25 ÷ 40	300	218	250	8	26	28	315	44	D	
		150	63	345	218	280	8	33	36	335	44	D	

\* Flanges according to ASME B16.5 are available on request.

z8-flange-en\_a\_td



## CARRYING CLAMPS



03730\_A\_SC

NOMINAL PIPE DIAMETER DN		CARRYING 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
125	R 5"	100	20	600	260	M24x90	7250	27,5	18,5	12,3
150	R 6"	100	20	600	260	M24x130	7250	33,0	22,0	17,6
175	R 7"	120	25	800	360	M30x110	9750	27,0	25,5	24,0
200	R 8"	120	25	800	360	M30x150	9750	33,0	34,0	31,5
250	R 10"	120	25	800	360	M30x220	9750	48,0	48,0	49,0

1) Max admissible weight.

clamp-en\_a\_td

NOTE. Two sets of supporting collars are necessary for installation.



## L6C - L6W - L8W - L10W 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		9,6	...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	17,1	...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	24,8	-	...110-150	...110-150	...110-150	...110-150	...150	
13	17,5	28,7	-	...110-150	...110-150	...110-150	...110-150	...150	
15	20	32,4	-	...150-185	...150-185	...150-185	...150-185	...220	
18,5	25	40,0	-	...185-220	...185-220	...185-220	...185-220	...220	
22	30	48,5	-	...220-300	...220-300	...220-300	...220-300	...300	
26	35	56,2	-	...220-300	...220-300	...220-300	...220-300	...300	
30	40	64,7	-	...300-370	...300-370	...300-370	...300-370	...370	
37	50	81,7	-	-	...370-450	...370-450	...370-450	...450	

For different voltages, please contact our sales network.

L6w-2p50-en\_a\_tc

MOTOR TYPE L8W - 8" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		Q3D/...	Q3I/...	Q3A/...	Q3SF/...		
	30	40		65	...300-370	...300-370	...300-370	...370	
37	50	81	(1)	...370-450	...370-450	...450			
45	60	92	(1)	...450-550	...450-550	...550			
52	70	110	(1)	...550-750	...550-750	...590			
55	75	118	(1)	...550-750	...550-750	...590			
60	80	124	-	...550-750	...550-750	...750			
67	90	138	-	...750-900	...750-900	...900			
75	100	156	-	...750-900	...750-900	...900			
83	110	172	-	...750-900	...750-900	...900			
93	125	192	-	...900-1100	...900-1100	...1100			

(1) On request.

L8w-2p50-en\_b\_tc

For different voltages, please contact our sales network.

MOTOR TYPE L10W - 10" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		Q3I/...	Q3A/...	Q3SF/...			
	93	125		191	...900-1100	...900-1100	...1100		
110	150	235	...1100-1320	...1100-1320	...1100				
130	175	270	...1320-1600	...1320-1600	(1)				
150	200	308	...1600-2000	...1600-2000	(1)				

(1) On request.

L10w-2p50-en\_b\_tc

For different voltages, please contact our sales network.

## Three-phase Electric Panel

### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

## QTD Series



### SPECIFICATIONS

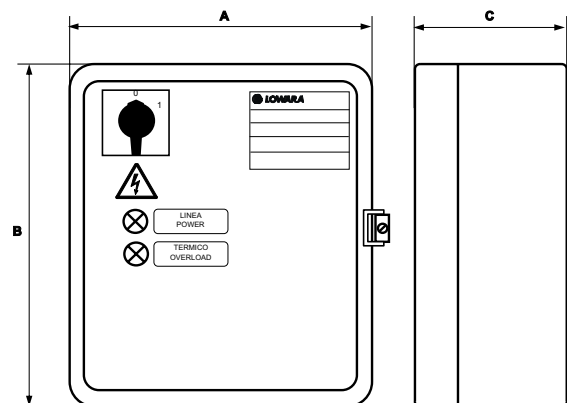
- Control through an external enable contact.
- Supply voltage: 3 x 400 V  $\pm$  10%.
- Frequency: 50/60 Hz.
- Power: 0,25 to 9,2 kW.
- Direct motor start.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Ready for installation of dry running control float or pressure switch (to be ordered separately).
- Power and thermal overload indicator lights.

### OPTIONAL ACCESSORIES

- VR3 three-phase module for overvoltage protection (lightning protector).
- SLD series 24 V level kit. Probe module for protection against dry running (set of three electrodes included in the supply).

### SELECTION

- For a suitable choice of control panel, be sure the electrical input of the motor (Ampere) is included in the rated current value mentioned in the table below.



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
QTD/02-03	3 x 400 V $\pm$ 10 %	0,25-0,37	0,33-0,50	0,63 ÷ 1	235	265	150	5,8
QTD/03-05	3 x 400 V $\pm$ 10 %	0,37-0,55	0,55-0,75	1 ÷ 1,6	235	265	150	5,8
QTD/05-07	3 x 400 V $\pm$ 10 %	0,55-0,75	0,75-1	1,6 ÷ 2,5	235	265	150	5,8
QTD/07-15	3 x 400 V $\pm$ 10 %	0,75-1,5	1-2	2,5 ÷ 4	235	265	150	5,8
QTD/15-22	3 x 400 V $\pm$ 10 %	1,5-2,2	2-3	4 ÷ 6,3	235	265	150	5,8
QTD/22-40	3 x 400 V $\pm$ 10 %	2,2-4	3-5,5	6,3 ÷ 10	235	265	150	5,8
QTD/40-75	3 x 400 V $\pm$ 10 %	4-7,5	5,5-10	10 ÷ 16	235	265	150	5,8
QTD/75-92	3 x 400 V $\pm$ 10 %	7,5-9,2	10-12,5	16 ÷ 20	235	265	150	5,8

## Three-phase Electric Panel

### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

## Q3D Series



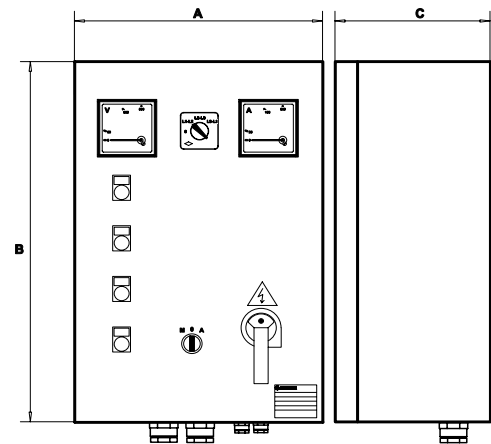
### SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V  $\pm$  10%.
- Frequency: 50/60 Hz.
- 24 V AC low voltage auxiliary circuit.
- Power: 0,25 to 37 kW.
- Direct motor start.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Power, pump running, thermal overload and dry running indicator lights.

- Ready for installation of dry running control float or pressure switch (to be ordered separately). Can be equipped with electronic protection module with electrodes.

### OPTIONAL ACCESSORIES

- SLD series 24 V level kit. Probe module for protection against dry running (set of three electrodes included in the supply).
- Float.
- Pressure switch.
- VR3/SCA3 three-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
Q3D/02-03	3 x 400 V $\pm$ 10 %	0,25-0,37	0,33-0,50	0,63 $\div$ 1	300	400	200	15
Q3D/03-05	3 x 400 V $\pm$ 10 %	0,37-0,55	0,5-0,75	1 $\div$ 1,6	300	400	200	15
Q3D/05-07	3 x 400 V $\pm$ 10 %	0,55-0,75	0,75-1	1,6 $\div$ 2,5	300	400	200	15
Q3D/07-15	3 x 400 V $\pm$ 10 %	0,75-1,5	1-2	2,5 $\div$ 4	300	400	200	15
Q3D/15-22	3 x 400 V $\pm$ 10 %	1,5-2,2	2-3	4 $\div$ 6,3	300	400	200	15
Q3D/22-40	3 x 400 V $\pm$ 10 %	2,2-4	3-5,5	6,3 $\div$ 10	300	400	200	15
Q3D/40-75	3 x 400 V $\pm$ 10 %	4-7,5	5,5-10	10 $\div$ 16	300	400	200	15
Q3D/75-92	3 x 400 V $\pm$ 10 %	7,5-9,2	10-12,5	16 $\div$ 20	300	400	200	15
Q3D/92-110	3 x 400 V $\pm$ 10 %	9,2-11	12,5-15	20 $\div$ 25	300	400	200	20
Q3D/110-150	3 x 400 V $\pm$ 10 %	11-15	15-20	22 $\div$ 32	400	500	200	20
Q3D/150-185	3 x 400 V $\pm$ 10 %	15-18,5	20-25	28 $\div$ 40	400	500	200	20
Q3D/185-220	3 x 400 V $\pm$ 10 %	18,5-22	25-30	36 $\div$ 50	400	600	200	27
Q3D/220-300	3 x 400 V $\pm$ 10 %	22-30	30-40	45 $\div$ 63	400	600	200	27
Q3D/300-370	3 x 400 V $\pm$ 10 %	30-37	40-50	57 $\div$ 75	400	600	200	27

## Three-phase Electric Panel

### Q3Y Series



### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

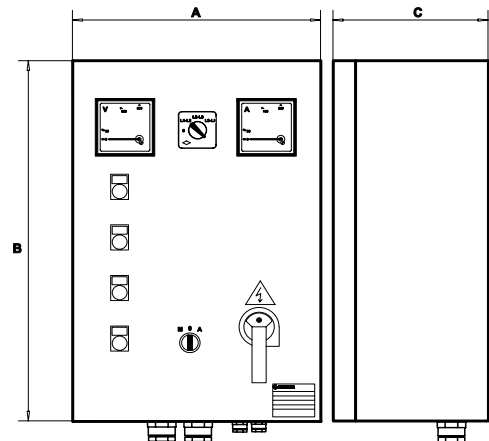
### SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V  $\pm$  10%.
- Frequency: 50/60 Hz.
- 24 V AC low voltage auxiliary circuit.
- Power: 4 to 315 kW.
- Star-delta starting.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Power, pump running, thermal overload and dry running indicator lights.

- Ready for installation of dry running control float or pressure switch (to be ordered separately). Can be equipped with electronic protection module with electrodes.

### OPTIONAL ACCESSORIES

- SLD series 24 V level kit. Probe module for protection against dry running (set of three electrodes included in the supply).
- Float.
- Pressure switch.
- VR3/SCA3 three-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
Q3Y/40-75	3 x 400 V $\pm$ 10 %	4-7,5	5,5-10	10 $\div$ 16	400	600	200	23
Q3Y/75-92	3 x 400 V $\pm$ 10 %	7,5-9,2	10-12,5	16 $\div$ 20	400	600	200	23
Q3Y/92-110	3 x 400 V $\pm$ 10 %	9,2-11	12,5-15	20 $\div$ 25	400	600	200	23
Q3Y/110-150	3 x 400 V $\pm$ 10 %	11-15	15-20	22 $\div$ 32	400	600	200	23
Q3Y/150-185	3 x 400 V $\pm$ 10 %	15-18,5	20-25	28 $\div$ 40	400	600	200	23
Q3Y/185-220	3 x 400 V $\pm$ 10 %	18,5-22	25-30	36 $\div$ 50	500	700	200	32
Q3Y/220-300	3 x 400 V $\pm$ 10 %	22-30	30-40	45 $\div$ 63	500	700	200	32
Q3Y/300-370	3 x 400 V $\pm$ 10 %	30-37	40-50	57 $\div$ 75	600	800	250	68
Q3Y/370-450	3 x 400 V $\pm$ 10 %	37-45	50-60	70 $\div$ 90	600	800	250	80
Q3Y/450-550	3 x 400 V $\pm$ 10 %	45-55	60-75	80 $\div$ 108	600	800	250	80
Q3Y/550-750	3 x 400 V $\pm$ 10 %	55-75	75-100	105 $\div$ 138	600	800	250	109
Q3Y/750-900	3 x 400 V $\pm$ 10 %	75-90	100-125	138 $\div$ 185	600p	1300p	300p	109
Q3Y/900-1100	3 x 400 V $\pm$ 10 %	90-110	125-150	175 $\div$ 210	600p	1500p	300p	120
Q3Y/1100-1320	3 x 400 V $\pm$ 10 %	110-132	150-180	210 $\div$ 260	800p	1700p	400p	130
Q3Y/1320-1600	3 x 400 V $\pm$ 10 %	132-160	180-218	250 $\div$ 305	800p	1700p	400p	130
Q3Y/1600-2000	3 x 400 V $\pm$ 10 %	160-200	218-273	290 $\div$ 400	800p	1900p	400p	140
Q3Y/2000-2500	3 x 400 V $\pm$ 10 %	200-250	273-340	400 $\div$ 460	1000p	1900p	400p	180
Q3Y/2500-3150	3 x 400 V $\pm$ 10 %	250-315	340-430	450 $\div$ 580	1000p	1900p	400p	180

Dimensions note : P indicates floor mounted control panel.

CB-Q3Y-en\_b\_te

## Three-phase Electric Panel

### Q3I Series



### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

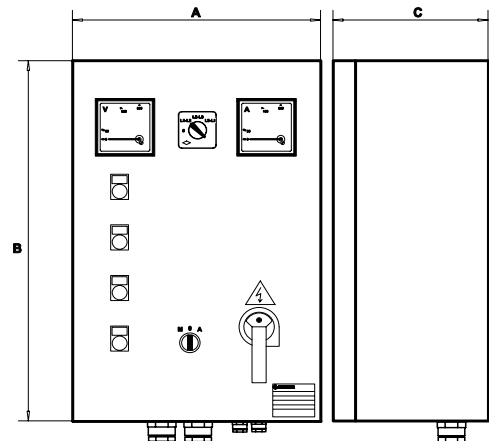
### SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V ± 10%.
- Frequency: 50/60 Hz.
- 24 V AC low voltage auxiliary circuit.
- Power: 4 to 315 kW.
- Impedance start.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Power, pump running, thermal overload and dry running indicator lights.

- Ready for installation of dry running control float or pressure switch (to be ordered separately). Can be equipped with electronic protection module with electrodes.

### OPTIONAL ACCESSORIES

- SLD series 24 V level kit. Probe module for protection against dry running (set of three electrodes included in the supply).
- Float.
- Pressure switch.
- VR3/SCA3 three-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
Q3I/40-75	3 x 400 V ± 10 %	4-7,5	5,5-10	10 ÷ 16	400	600	250	35
Q3I/75-92	3 x 400 V ± 10 %	7,5-9,2	10-12,5	16 ÷ 20	400	600	250	35
Q3I/92-110	3 x 400 V ± 10 %	9,2-11	12,5-15	20 ÷ 25	400	600	250	35
Q3I/110-150	3 x 400 V ± 10 %	11-15	15-20	22 ÷ 32	500	700	250	50
Q3I/150-185	3 x 400 V ± 10 %	15-18,5	20-25	28 ÷ 40	500	700	250	50
Q3I/185-220	3 x 400 V ± 10 %	18,5-22	25-30	36 ÷ 50	500	700	250	50
Q3I/220-300	3 x 400 V ± 10 %	22-30	30-40	45 ÷ 63	500	700	250	65
Q3I/300-370	3 x 400 V ± 10 %	30-37	40-50	57 ÷ 75	500	700	250	65
Q3I/370-450	3 x 400 V ± 10 %	37-45	50-60	70 ÷ 90	600	900	250	65
Q3I/450-550	3 x 400 V ± 10 %	45-55	60-75	80 ÷ 108	600p	1300p	300p	100
Q3I/550-750	3 x 400 V ± 10 %	55-75	75-100	105 ÷ 138	600p	1300p	300p	100
Q3I/750-900	3 x 400 V ± 10 %	75-90	100-125	138 ÷ 185	600p	1500p	300p	100
Q3I/900-1100	3 x 400 V ± 10 %	90-110	125-150	175 ÷ 210	600p	1500p	300p	100
Q3I/1100-1320	3 x 400 V ± 10 %	110-132	150-180	210 ÷ 260	800p	1700p	400p	150
Q3I/1320-1600	3 x 400 V ± 10 %	132-160	180-218	250 ÷ 305	800p	1700p	400p	150
Q3I/1600-2000	3 x 400 V ± 10 %	160-200	218-273	290 ÷ 400	800p	1900p	400p	160
Q3I/2000-2500	3 x 400 V ± 10 %	200-250	273-340	400 ÷ 460	1000p	1900p	400p	180
Q3I/2500-3150	3 x 400 V ± 10 %	250-315	340-430	450 ÷ 580	1000p	1900p	400p	200

Dimensions note : P indicates floor mounted control panel.

CB-Q3I-en\_b\_te



## Three-phase Electric Panel

### Q3A Series



### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

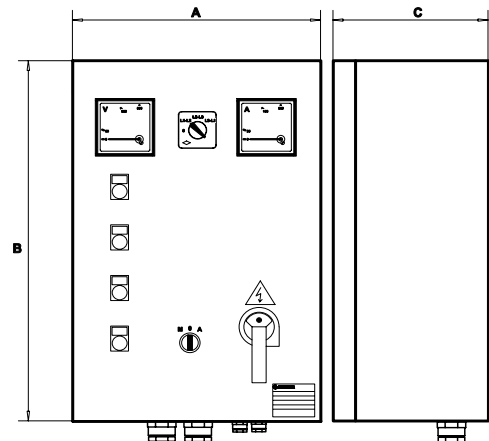
### SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V  $\pm$  10%.
- Frequency: 50/60 Hz.
- 24 V AC low voltage auxiliary circuit.
- Power: 4 to 315 kW.
- Starting autotransformer.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Power, pump running, thermal overload and dry running indicator lights.

- Ready for installation of dry running control float or pressure switch (to be ordered separately). Can be equipped with electronic protection module with electrodes.

### OPTIONAL ACCESSORIES

- SLD series 24 V level kit. Probe module for protection against dry running (set of three electrodes included in the supply).
- Float.
- Pressure switch.
- VR3/SCA3 three-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
Q3A/40-75	3 x 400 V $\pm$ 10 %	4-7,5	5,5-10	10 $\div$ 16	500	700	250	50
Q3A/75-92	3 x 400 V $\pm$ 10 %	7,5-9,2	10-12,5	16 $\div$ 20	500	700	250	50
Q3A/92-110	3 x 400 V $\pm$ 10 %	9,2-11	12,5-15	20 $\div$ 25	500	700	250	50
Q3A/110-150	3 x 400 V $\pm$ 10 %	11-15	15-20	22 $\div$ 32	500	700	250	50
Q3A/150-185	3 x 400 V $\pm$ 10 %	15-18,5	20-25	28 $\div$ 40	500	700	250	50
Q3A/185-220	3 x 400 V $\pm$ 10 %	18,5-22	25-30	36 $\div$ 50	500	700	250	50
Q3A/220-300	3 x 400 V $\pm$ 10 %	22-30	30-40	45 $\div$ 63	600	900	300	80
Q3A/300-370	3 x 400 V $\pm$ 10 %	30-37	40-50	57 $\div$ 75	600	900	300	80
Q3A/370-450	3 x 400 V $\pm$ 10 %	37-45	50-60	70 $\div$ 90	600p	1300p	300p	90
Q3A/450-550	3 x 400 V $\pm$ 10 %	45-55	60-75	80 $\div$ 108	600p	1500p	300p	120
Q3A/550-750	3 x 400 V $\pm$ 10 %	55-75	75-100	105 $\div$ 138	600p	1500p	300p	120
Q3A/750-900	3 x 400 V $\pm$ 10 %	75-90	100-125	138 $\div$ 185	600p	1700p	400p	150
Q3A/900-1100	3 x 400 V $\pm$ 10 %	90-110	125-150	175 $\div$ 210	600p	1700p	400p	150
Q3A/1100-1320	3 x 400 V $\pm$ 10 %	110-132	150-180	210 $\div$ 260	800p	1900p	400p	200
Q3A/1320-1600	3 x 400 V $\pm$ 10 %	132-160	180-218	250 $\div$ 305	800p	1900p	400p	200
Q3A/1600-2000	3 x 400 V $\pm$ 10 %	160-200	218-273	290 $\div$ 400	800p	1900p	400p	230
Q3A/2000-2500	3 x 400 V $\pm$ 10 %	200-250	273-340	400 $\div$ 460	1000p	1900p	400p	230
Q3A/2500-3150	3 x 400 V $\pm$ 10 %	250-315	340-430	450 $\div$ 580	1000p	1900p	400p	250

Dimensions note : P indicates floor mounted control panel.

CB-Q3A-en\_b\_te

## Three-phase Electric Panel

### Q3SF Series



#### APPLICATIONS

- Protection and control of a three-phase surface or submersible electric pump.

#### SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V  $\pm$  10%.
- Frequency: 50/60 Hz.
- 24 V AC low voltage auxiliary circuit.
- Power: 5,5 to 110 kW.
- Softstart with torque control.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Metal enclosure.
- Dry running indicator light.
- Power - pump running - malfunction LEDs on starter keypad.
- ON/OFF selector switch for activation of by-pass contactor.
- Ready for installation of dry running control float or pressure switch (to be ordered separately). Can be equipped with electronic protection module with electrodes.

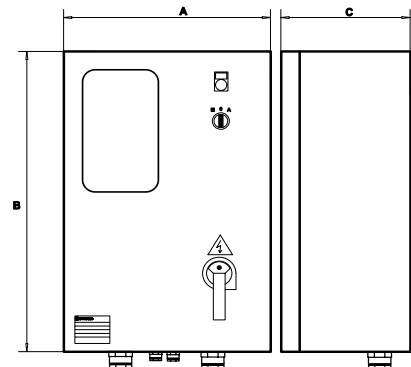
Protections against phase failure / phase sequence / frequency out of limits on power supply line.  
 Low-voltage protection on auxiliary circuits.  
 Protection against starter overtemperature / overload / malfunction.  
 Protection against overload / locked rotor / current asymmetry on motor side.  
 Short-circuit protection on inputs and outputs.  
 RS232 interface for remote control and RS485 for use of remote keypad.  
 Incorporated by-pass contactor.

#### OPTIONAL ACCESSORIES

- SLD series 24 V level kit.  
 Probe module for protection against dry running (set of three electrodes included in the supply).
- Float.
- Pressure switch.
- VR3/SCA3 three-phase module for overvoltage protection (lightning protector).

#### STATIC STARTER CHARACTERISTICS

- Static starter for gradual start-up/shutdown, featuring: keypad with liquid crystal display showing voltage, absorbed current,  $\cos \Phi$ , operating hours, number of starts, last twenty messages on system status (events / alarms).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg
		kW	HP		A mm	B mm	C mm	
Q3SF 75	3 x 400 V $\pm$ 10 %	5,5 - 7,5	7,5 - 10	8,5 $\div$ 17	400	600	250	35
Q3SF 150	3 x 400 V $\pm$ 10 %	9,2 - 15	12,5 - 20	15 $\div$ 30	500	700	250	40
Q3SF 220	3 x 400 V $\pm$ 10 %	18,5 - 22	25 - 30	28 $\div$ 45	500	700	250	40
Q3SF 300	3 x 400 V $\pm$ 10 %	30	40	42 $\div$ 60	600	900	300	90
Q3SF 370	3 x 400 V $\pm$ 10 %	37	50	55 $\div$ 75	600	900	300	90
Q3SF 450	3 x 400 V $\pm$ 10 %	45	60	70 $\div$ 85	600	900	300	90
Q3SF 550	3 x 400 V $\pm$ 10 %	55	75	80 $\div$ 110	600	900	300	90
Q3SF 590	3 x 400 V $\pm$ 10 %	59	80	105 $\div$ 125	600	900	300	90
Q3SF 750	3 x 400 V $\pm$ 10 %	75	100	120 $\div$ 142	600p	1700p	400p	120
Q3SF 900	3 x 400 V $\pm$ 10 %	90	125	135 $\div$ 190	600p	1700p	400p	120
Q3SF 1100	3 x 400 V $\pm$ 10 %	110	150	185 $\div$ 245	600p	1700p	400p	120

Dimensions note : P indicates floor mounted control panel.

CB-Q3SF-en\_b\_te

## Level Control Panel

### APPLICATIONS

- Accessory for electric pump control panels, suitable for tank filling or drainage applications or for activation of audible or visual alarms.

## QCL5 Series



### SPECIFICATIONS

- Automatic control through probes.
- Supply voltage: 1 x 230 V  $\pm$ 10% or 1 x 24 V  $\pm$ 10%.
- Frequency: 50/60 Hz.
- Voltage to probes: 15 V AC at 0,5 mA max.
- Switch contact 48 V AC at 3 A max (250 W max).
- Protection class: IP55.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative humidity: 50% at +40°C, provided that no condensation occurs (according to EN 60439-1).
- Wall mounted.
- Plastic enclosure.
- Electrodes suitable for water at a maximum temperature of 40°C.
- Set of three electrodes included in the supply.

### OPTIONAL ACCESSORIES

- Drop cable with circular cross section.

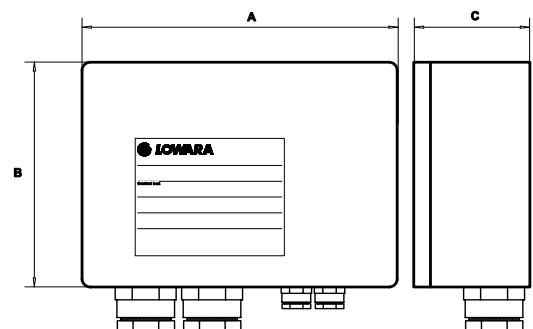
For connection of the electrodes to the panel we recommend the following cross sections:

LENGHT m		CABLE CROSS SECTION mm <sup>2</sup>
0	50	0,5
50	100	0,8
100	200	1,0
200	400	2,5
400	>	4,0

CB-CASEL-en\_a\_te

Three-pole cables can be used for short lengths.

Otherwise we recommend the use of unipolar cables placed at suitable distance from each other to prevent the capacitive effect of the cable from interfering with the proper operation of the electronic module.



TYPE	POWER SUPPLY			CONTACT			DIMENSIONS A x B x C mm	WEIGHT Kg
	VOLTAGE V	FREQUENCY Hz	POWER W	TYPE	RANGE V A			
QCL5/24	1 x 24	50/60	2	NO-C-NC	48	3	90 x 130 x 60	0,5
QCL5/230	1 x 230	50/60	2					

CB-QCL5-en\_a\_te

**Level  
Probe  
Module**
**APPLICATIONS**

- Accessory for electric panels.

**SLD Series**

**SPECIFICATIONS**

- Electronic module for use of probes as protection against dry running.
- Supply voltage:  
1 x 24 V  $\pm$  10% for model SLD/24.
- Frequency: 50/60 Hz.
- Absorbed power: 2 VA.
- Voltage to probes:  
15 V AC at 0,5 mA max.
- Switch contact 24 V AC at 5 A max (250 W max).
- Designed for installation on Lowara electric panels featuring DIN bar.
- Electrodes suitable for water at a maximum temperature of 40°C.

**CONSTRUCTION  
CHARACTERISTICS**

- Module made of plastic material with DIN bar attachment.
- Cables with quick plug-in connectors.
- Set of three electrodes included in the supply.
- Electrodes with nylon 6 body, stainless steel sensitive element brass washer and nitrile rubber seal.

**OPTIONAL  
ACCESSORIES**

- Drop cable with circular cross section.

For connection of the electrodes to the panel we recommend the following cross sections:

LENGHT m		CABLE CROSS SECTION mm <sup>2</sup>
0	50	0,5
50	100	0,8
100	200	1,0
200	400	2,5
400	>	4,0

CB-CASEL-en\_a\_te

Three-pole cables can be used for short lengths.

Otherwise we recommend the use of unipolar cables placed at suitable distance from each other to prevent the capacitive effect of the cable from interfering with the proper operation of the electronic module.

TYPE	POWER SUPPLY		POWER W	CONTACT			DIMENSIONS A x B x C mm	WEIGHT Kg	PANELS
	MAIN V			TYPE	RANGE V	A			
KIT SLD/24	1x24	50/60 Hz	2	N0-C-NC	24	5	90 x 35 x 60	0,5	QMCS-QM-QTD-Q3D-Q3Y-Q3A-Q3I-Q3SF

CB-SLD-en\_a\_te

## Lightning Protection

### APPLICATIONS

- Accessory for electric panels.

## DPF Series



### SPECIFICATIONS

- Varistor for overvoltage protection of single-phase lines. To be connected between the phase and neutral conductor.
- Operating voltage: 460 V AC.
- Maximum varistor voltage: 750 V with 100 A peak current.

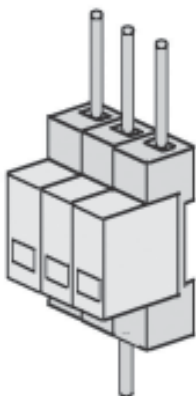
## VR Series



### SPECIFICATIONS

- Varistors for overvoltage protection of three-phase lines.
- To be connected between the phases (VR3 model).
- Operating voltage: 460 V AC.
- Maximum varistor voltage: 750 V with 100 A peak current.
- Designed for installation on Lowara electric panels featuring DIN bar.

## SCA3 Series



### SPECIFICATIONS

- Lightning arresters for overvoltage protection of three-phase lines. To be connected between the phases and the heart conductor,
- Operating voltage: 500 V AC.
- Maximum varistor voltage: 2,5 kW with 40 kA peak current.
- Designed for installation on Lowara electric panels featuring DIN bar.

TYPE	VOLTAGE V	PANELS
DPF	1 x 220-240 50/60 Hz	QSM - QMC - QMCS - QPC
KIT VR1	1 x 220-230 50/60 Hz	QM - QDRM - QDRM2
KIT VR3	3 x 400 50/60 Hz	QTD - QDR - QDR2 - Q3D
KIT SCA 3	3 x 400 50/60 Hz	Q3Y-Q3A-Q3I-Q3SF-Q3D

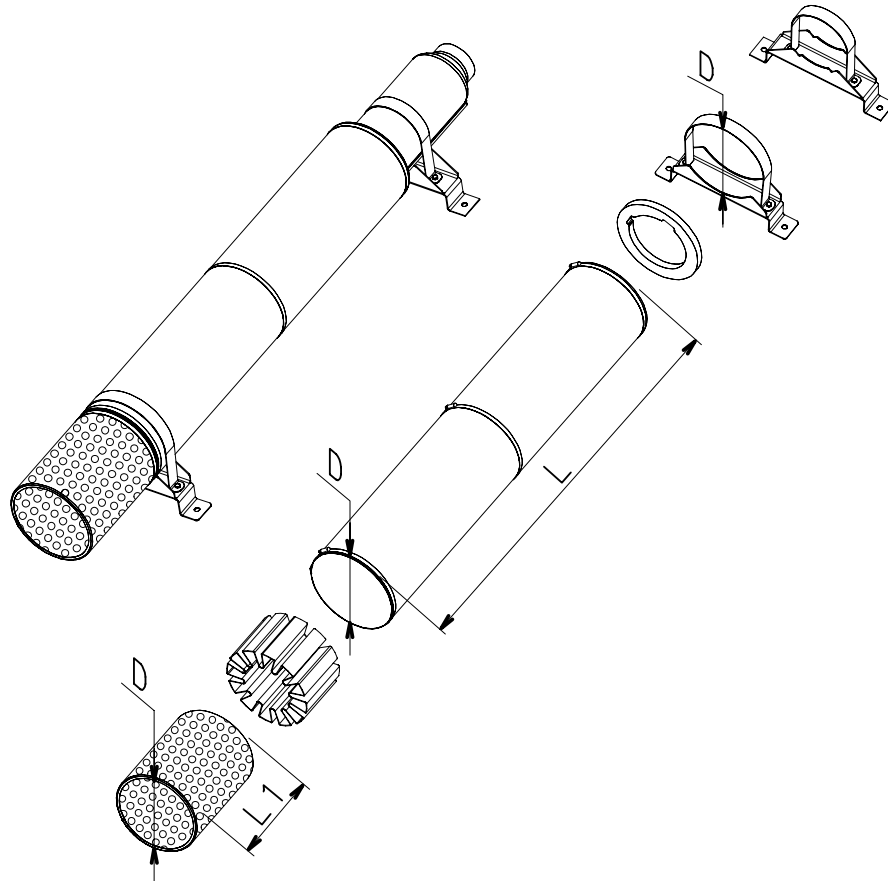


# ITT

# Lowara

## COOLING SHROUDS

01890\_B\_DD





# ITT

# Lowara

## COOLING SHROUDS Z8 PUMP SERIES 6", 8" and 10" MOTORS COMBINATION TABLE

PUMP TYPE	MOTOR TYPE				COOLING SET SHROUD (D x L)	COOLING SET FILTER (D x L1)	COOLING SET BRACKETS (D)
	L6C	L6W	L8W	L10W			
Z855 Z875	5,5	5,5			D225X1000	D225X192	D225 - 2PZ
	7,5	7,5					
	9,3	9,3					
	11	11					
	-	13			D225X1250	D225X192	D225 - 2PZ
	15	15					
	18,5	18,5					
	22	22			D225X1500	D225X192	D225 - 3PZ
	-	26					
30	30						
37	37						
Z895 Z8125	7,5	7,5			D256X1000	D256X325	D256 - 2PZ
	11	11					
	-	13					
	15	15			D256X1250	D256X325	D256 - 2PZ
	18,5	18,5					
	22	22			D256X1500	D256X325	D256 - 3PZ
	-	26					
30	30						
37	37						
Z855 Z875			30		D256X1500	D256X325	D256 - 3PZ
			37				
			45				
			52				
			55				
			60		D256X1750	D256X325	D256 - 3PZ
			67				
			75				
			83				
		93		D256X2000	D256X325	D256 - 3PZ	
Z895 Z8125			30		D285X1500	D285X385	D285 - 3PZ
			37				
			45				
			52				
			55				
			60		D285X1750	D285X385	D285 - 3PZ
			67				
			75				
			83				
		93		D285X2000	D285X385	D285 - 3PZ	
Z855 Z875				93	D285X2250	D285X385	D285 - 3PZ
				110			
				130			
				150			
Z895 Z8125				93	D330X2250	D330X385	D330 - 3PZ
				110			
				130			
				150			

Z8\_kit-raf50-en\_b\_ta



**Lowara**





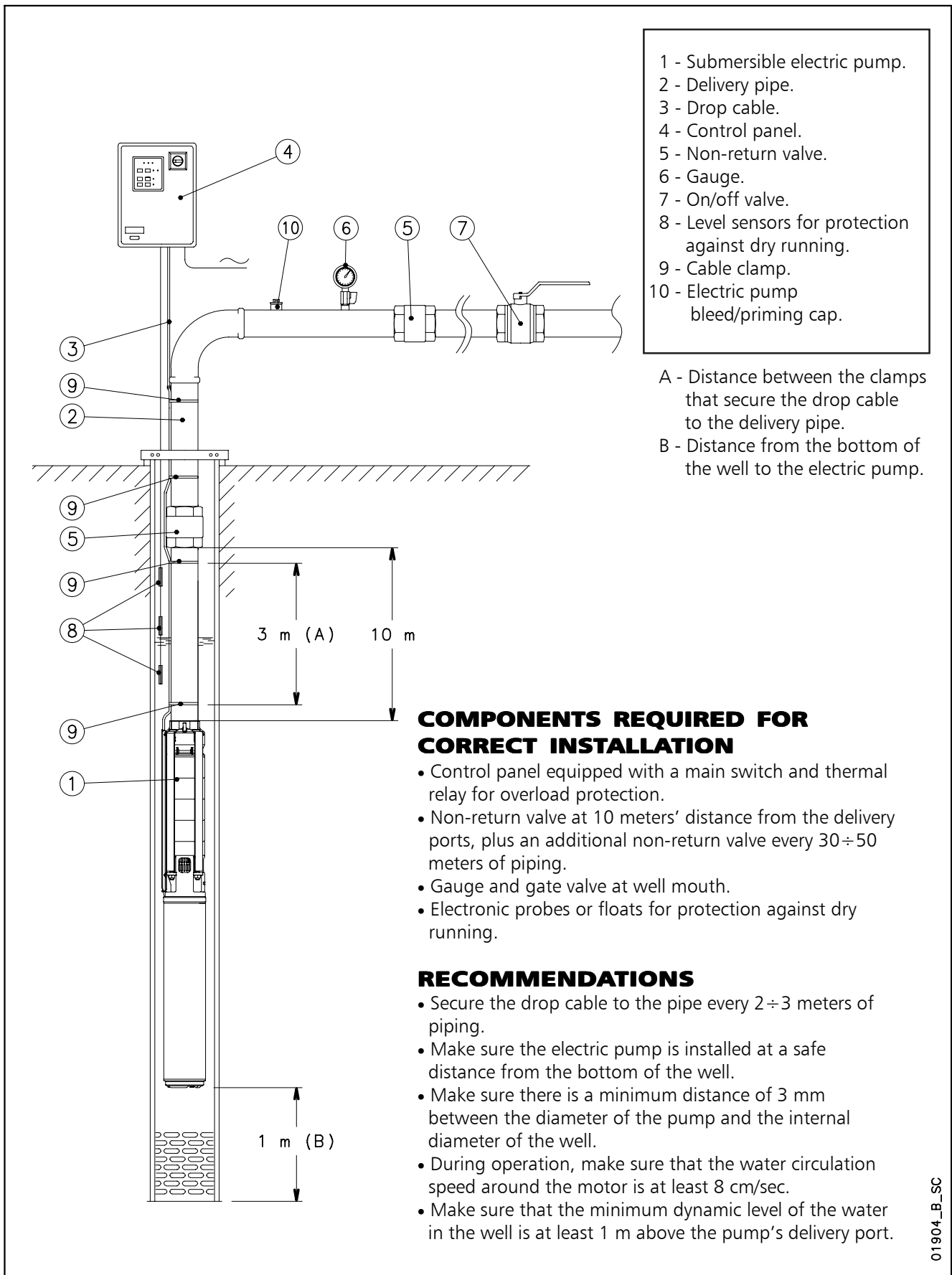
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# **TECHNICAL APPENDIX**

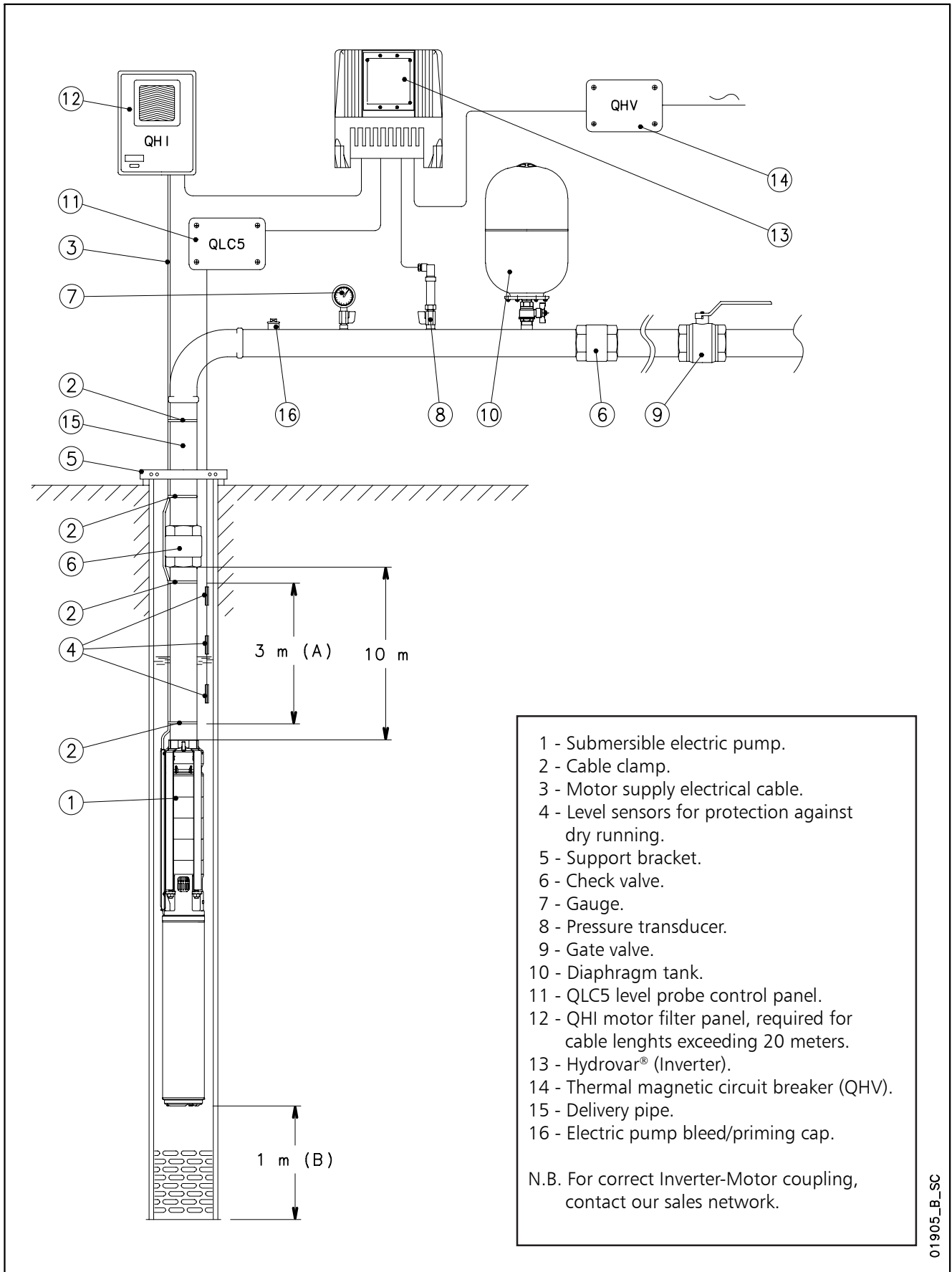


## SUBMERSIBLE ELECTRIC PUMP INSTALLATION DIAGRAM





## EXAMPLE OF INSTALLATION OF A SUBMERSIBLE ELECTRIC PUMP CONTROLLED BY AN INVERTER (HYDROVAR®)



01905\_B\_SC

## L6C SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C					
		35	40	45	50	55	60
L6C	all models	1	0,95	0,8	0,75	0,7	0,6

L6c-derating-50-en\_b\_te

**EXAMPLE:**

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

## L6W SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C							
		25	30	35	40	45	50	55	60
L6W (1)	all models	1	0,85	0,74	-	-	-	-	-
L6W (2)	all models	1	1	1	1	0,95	0,85	0,75	0,65

(1) Standard winding for water temperature up to 35 °C.

l6w-derating-en\_b\_te

(2) Special winding for water temperature from 35 °C to 60 °C.

**EXAMPLE:**

A 15 kW L6W motor is to be used in 35°C water.

Motor power at 35 °C = 15 x 0,74 = 11,1 kW

## L8W SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C							
		25	30	35	40	45	50	55	60
L8W (1)	all models	1	0,85	0,74	-	-	-	-	-
L8W (2)	all models	1	1	1	1	0,95	0,85	0,75	0,65

(1) Standard winding for water temperature up to 35 °C.

l8w-derating-en\_b\_te

(2) Special winding for water temperature from 35 °C to 60 °C.

**EXAMPLE:**

A 55 kW L8W motor is to be used in 35°C water.

Motor power at 35 °C = 55 x 0,74 = 40,7 kW

## L10W SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C							
		25	30	35	40	45	50	55	60
L10W (1)	all models	1	0,85	0,74	-	-	-	-	-
L10W (2)	all models	1	1	1	1	0,95	0,85	0,75	0,65

(1) Standard winding for water temperature up to 35 °C.

l10w-derating-en\_b\_te

(2) Special winding for water temperature from 35 °C to 60 °C.

**EXAMPLE:**

A 110 kW L10W motor is to be used in 35°C water.

Motor power at 35 °C = 110 x 0,74 = 81,4 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, between 101 and 161 metres, the second value corresponding to a 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 80°C, water installation similar to air installation at a temperature of 30°C.

**L6C, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES  
DIRECT START**

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	1,5	2,5	4	6	10	16	25
							A max	17	23	32	42	54	75	100	127
Maximum lenght in mrtres															
L6C40T235	4	5,5	220	0,8	17,8	4	-	30	50	80	119	199	319		
			230	0,75	18,4		-	32	54	86	129	216	345		
			240	0,7	19,1		-	35	58	93	139	232	372		
L6C55T235	5,5	7,5	220	0,8	24,1		-	-	37	59	89	148	236		
			230	0,75	24,2		-	-	41	65	98	163	261		
			240	0,71	25,3		-	-	43	69	104	173	276		
L6C75T235	7,5	10	220	0,82	30,5		-	-	-	45	68	114	182	284	
			230	0,78	31,2		-	-	-	49	73	122	196	305	
			240	0,73	31,7		-	-	-	54	80	134	214	335	
L6C93T235	9,3	12,5	220	0,82	37,6		-	-	-	37	55	92	148	231	
			230	0,8	38,1		-	-	-	39	58	97	156	244	
			240	0,79	39,5		-	-	-	40	60	99	159	248	
L6C110T235	11	15	220	0,87	43,3		-	-	-	-	45	75	121	189	
			230	0,82	44,2		-	-	-	-	49	82	131	205	
			240	0,79	45,0		-	-	-	-	52	87	139	218	
L6C150T235	15	20	220	0,84	58,0		-	-	-	-	-	58	93	146	
			230	0,8	57,9		-	-	-	-	-	64	103	161	
			240	0,76	59,2		-	-	-	-	-	69	110	172	
L6C185T235	18,5	25	220	0,83	70,1		-	-	-	-	-	49	78	122	
			230	0,8	71,0		-	-	-	-	-	52	84	131	
			240	0,73	72,7		-	-	-	-	-	58	93	146	
L6C220T235	22	30	220	0,88	82,3		-	-	-	-	-	-	63	98	
			230	0,84	81,4		-	-	-	-	-	-	70	109	
			240	0,8	82,3		-	-	-	-	-	-	75	118	
L6C40T405	4	5,5	380	0,8	10,3			60	89	149	238	357			
			400	0,75	10,6			65	98	163	260	390			
			415	0,7	11			70	104	174	279	418			
L6C55T405	5,5	7,5	380	0,8	13,9			44	66	110	177	265	442		
			400	0,75	14			49	74	123	197	295	492		
			415	0,71	14,6			52	78	129	207	310	517		
L6C75T405	7,5	10	380	0,82	17,6		-	51	85	136	204	340			
			400	0,78	18		-	55	92	147	221	368			
			415	0,73	18,3		-	60	100	161	241	401			
L6C93T405	9,3	12,5	380	0,82	21,7		-	-	69	110	166	276			
			400	0,8	22		-	-	73	117	176	294			
			415	0,79	22,8		-	-	74	119	179	298			
L6C110T405	11	15	380	0,87	25		-	-	56	90	135	226	361		
			400	0,82	25,5		-	-	62	99	148	247	395		
			415	0,79	26		-	-	65	104	157	261	418		
L6C150T405	15	20	380	0,84	33,5		-	-	-	70	105	174	279		
			400	0,8	33,4		-	-	-	77	116	193	309		
			415	0,76	34,2		-	-	-	83	124	206	330		
L6C185T405	18,5	25	380	0,83	40,5		-	-	-	88	146	234	365		
			400	0,8	41		-	-	-	95	158	252	394		
			415	0,73	42		-	-	-	105	175	280	437		
L6C220T405	22	30	380	0,88	47,5		-	-	-	70	117	188	294		
			400	0,84	47		-	-	-	79	131	209	327		
			415	0,8	47,5		-	-	-	85	141	226	353		
L6C300T405	30	40	380	0,89	63		-	-	-	-	88	140	219		
			400	0,85	61,5		-	-	-	-	99	158	247		
			415	0,8	63,5		-	-	-	-	106	169	264		
L6C370T405	37	50	380	0,87	79,5		-	-	-	-	-	114	177		
			400	0,84	79,3		-	-	-	-	-	-	124	194	
			415	0,8	80		-	-	-	-	-	-	134	209	

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 80°C.

l6c-cavi-50-en\_e\_te



## L6W, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES DIRECT START

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	1,5	2,5	4	6	10	16	25
							A max	17	23	32	42	54	75	100	127
							Maximum lenght in metres								
L6W40T405	4	5,5	380	0,91	9,62	4		56	84	140	224	336			
			415	0,86	8,94			70	105	174	279	418			
L6W55T405	5,5	7,5	380	0,89	12,7			43	65	109	174	261			
			415	0,83	12,3			53	79	131	210	315			
L6W75T405	7,5	10	380	0,9	17,1			-	48	80	128	191	319		
			415	0,84	16,4			-	58	97	156	234	389		
L6W93T405	9,3	12,5	380	0,89	20,5			-	-	67	108	161	269		
			415	0,83	19,8			-	-	82	131	196	326		
L6W110T405	11	15	380	0,89	24,8			-	-	56	89	133	222	356	
			415	0,82	24,0			-	-	68	109	163	272	436	
L6W130T405	13	17,5	380	0,9	28,7			-	-	48	76	114	190	304	
			415	0,84	27,5			-	-	58	93	139	232	371	
L6W150T405	15	20	380	0,89	32,4			-	-	-	68	102	170	272	
			415	0,84	31,1			-	-	-	82	123	205	328	
L6W185T405	18,5	25	380	0,87	40,0			-	-	-	-	85	141	226	353
			415	0,81	39,6			-	-	-	-	100	167	267	418
L6W220T405	22	30	380	0,88	48,5			-	-	-	-	69	115	184	288
			415	0,82	45,4			-	-	-	-	86	144	230	360
L6W260T405	26	35	380	0,88	56,2			-	-	-	-	-	99	159	248
			415	0,83	53,4			-	-	-	-	-	-	121	194
L6W300T405	30	40	380	0,88	64,7		-	-	-	-	-	86	138	216	
			415	0,83	61,4		-	-	-	-	-	-	105	168	263
L6W370T405	37	50	380	0,88	81,7		-	-	-	-	-	-	109	171	
			415	0,82	78,8		-	-	-	-	-	-	-	133	207

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 80°C.

l6w-cavi-50-en\_a\_te

### L8W, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES DIRECT START

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: ...mm <sup>2</sup>									
							mm <sup>2</sup>	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	0,85	65	4		89	142	222	311					
			415	0,84	59			108	173	270	379					
L8W370T405	37	50	380	0,87	81			-	111	174	244	348				
			415	0,83	76			-	136	213	298	425				
L8W450T405	45	60	380	0,87	92			-	98	153	215	307				
			415	0,83	88,5			-	117	182	255	365				
L8W520T405	52	70	380	0,86	110			-	-	130	182	259	363			
			415	0,82	104			-	-	157	220	314	440			
L8W550T405	55	75	380	0,87	118			-	-	120	167	239	335	454		
			415	0,83	110			-	-	147	206	294	411	558		
L8W600T405	60	80	380	0,87	124			-	-	114	159	228	319	432		
			415	0,83	118			-	-	137	192	274	383	520		
L8W670T405	67	90	380	0,88	138			-	-	-	141	202	283	384	485	
			415	0,83	132			-	-	-	171	245	343	465	587	
L8W750T405	75	100	380	0,87	156			-	-	-	-	181	253	344	434	
			415	0,82	148			-	-	-	-	221	309	420	530	
L8W830T405	83	110	380	0,87	172		-	-	-	-	164	230	312	394		
			415	0,82	163		-	-	-	-	201	281	381	481		
L8W930T405	93	125	380	0,87	192		-	-	-	-	-	206	279	353		
			415	0,83	180		-	-	-	-	-	251	341	431		

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 80°C.

l8w-cavi-50-en\_a\_te

### L10W, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES DIRECT START

MOTOR TYPE THREE-PHASE	RATED POWER Kw   HP		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: ...mm <sup>2</sup>								
							mm <sup>2</sup>	50	70	95	120	150	185	240	300
							A max	192	246	298	346	399	456	538	621
maximum lenght in metres															
L10W930T405	93	125	380	0,87	191	4		148	207	281	355				
			415	0,84	180			177	248	337	426				
L10W1100T405	110	150	380	0,86	235			-	170	231	292	364			
			415	0,82	220			-	208	282	357	446			
L10W1300T405	130	175	380	0,86	270			-	-	201	254	317	391		
			415	0,83	255			-	-	241	304	380	469		
L10W1500T405	150	200	380	0,86	308			-	-	-	222	278	343		
			415	0,84	285			-	-	-	269	336	414		

Exposed cable laid at a temperature of 30°C, maximum conductor temperature of 80°C.

l10w-cavi-50-en\_a\_te





## JOINT BETWEEN DROP CABLE AND MOTOR CABLE

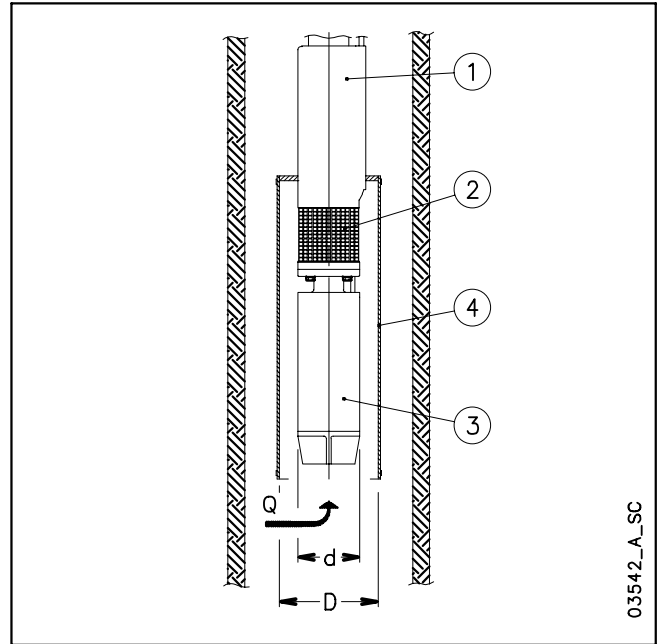
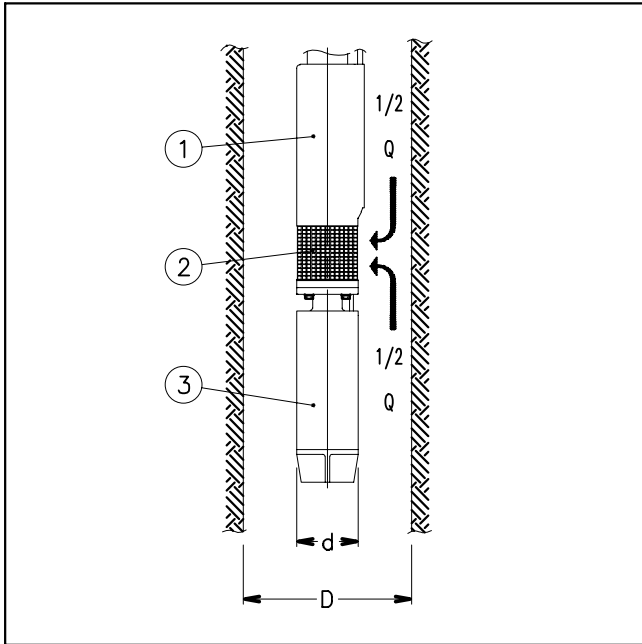
MOTOR TYPE	POWER kW	TYPE OF JOINT	FOUR-CORE DROP CABLE - SECTION (mm <sup>2</sup> )															
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
4OS L4C	0,37 - 7,5	Resin-filled method	GR2	GR2	GR2 GR6	GR2 GR6	GR2 GR6	GR6 GR7	GR6 GR7	GR7 GR5	GR5	GR5	GR5	-	-	-	-	-
		Heat-shrink method	GT1	GT1	GT2	GT2	GT3	GT4	GT5	GT6	-	-	-	-	-	-	-	-
		Tape method	Self-vulcanizing tape + self-vulcanizing sealing putty and PVC tape (1)															
L6C L6W	4 - 37	Resin-filled method	GR2	GR2	GR2 GR6	GR2 GR6	GR2 GR6	GR6 GR7	GR6 GR7	GR7 GR5	GR5	GR5	GR5	-	-	-	-	-
		Heat-shrink method	GT1	GT1	GT2	GT2	GT3	GT4	GT5	GT6	-	-	-	-	-	-	-	-
		Tape method	Self-vulcanizing tape + self-vulcanizing sealing putty and PVC tape (1)															

MOTOR TYPE	POWER kW	TYPE OF JOINT	THREE-CORE DROP CABLE - SECTION (mm <sup>2</sup> )															
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
L6C L6W	4 - 37	Resin-filled method	GR2	GR2	GR2 GR6	GR2 GR6	GR2 GR6	GR6 GR7	GR6 GR7	GR7 GR5	GR5	GR5	GR5	-	-	-	-	-
		Heat-shrink method	GT1	GT1	GT2	GT2	GT3	GT4	GT5	GT6	-	-	-	-	-	-	-	-
		Tape method	Self-vulcanizing tape + PVC tape															

MOTOR TYPE	POWER kW	TYPE OF JOINT	SINGLE-CORE DROP CABLE - SECTION (mm <sup>2</sup> )															
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
L8W L10W L12W	30 - 300	Resin-filled method	-	GR1	GR1	GR1	GR1	GR1	GR1 GR3	GR1 GR3	GR1 GR3	GR3 GR4	GR3 GR4	GR3 GR4	GR3 GR4	GR3 GR4	GR4	GR4
		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.

## 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] corresponds to the diameter of the well;  
 d in [m] corresponds to 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<sub>m</sub>): if v ≥ v<sub>m</sub> it means that the motor is properly cooled, if v < v<sub>m</sub> 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) / {π·[(0.203)<sup>2</sup>/4 – (0.144)<sup>2</sup>/4]} = 0.17 m/s.

The minimum speed required for proper motor cooling is v<sub>m</sub> = 0.20 m/s.

Because v < v<sub>m</sub>, 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<sub>m</sub> = 0.20 m/s.

Cooling sleeve diameter D = {4·[(0.0042/(0.2·π)+(0.144)<sup>2</sup>/4]}<sup>0.5</sup> = 0.217 m.

## 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.

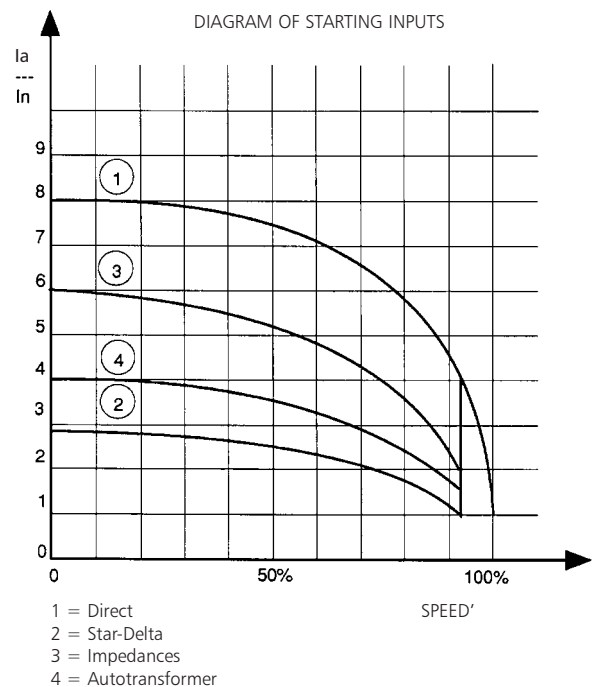
$$\text{Rated voltage } U_n = 400 \text{ V}$$

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

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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.

$$f = \frac{1}{\sqrt{(0,857 \times Nr \times Na)}} \quad \text{Coefficient for apartments with one bathroom and flush tank WC}$$

$$f = \frac{1}{\sqrt{(0,857 \times Nr \times Na)}} \quad \text{Coefficient for apartments with one bathroom and controlled flushing system WC}$$

$$f = \frac{1,03}{\sqrt{(0,545 \times Nr \times Na)}} \quad \text{Coefficient for apartments with two bathrooms and flush tank WC}$$

$$f = \frac{0,8}{\sqrt{(0,727 \times Nr \times Na)}} \quad \text{Coefficient for apartments with two bathrooms and controlled flushing system WC}$$

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.

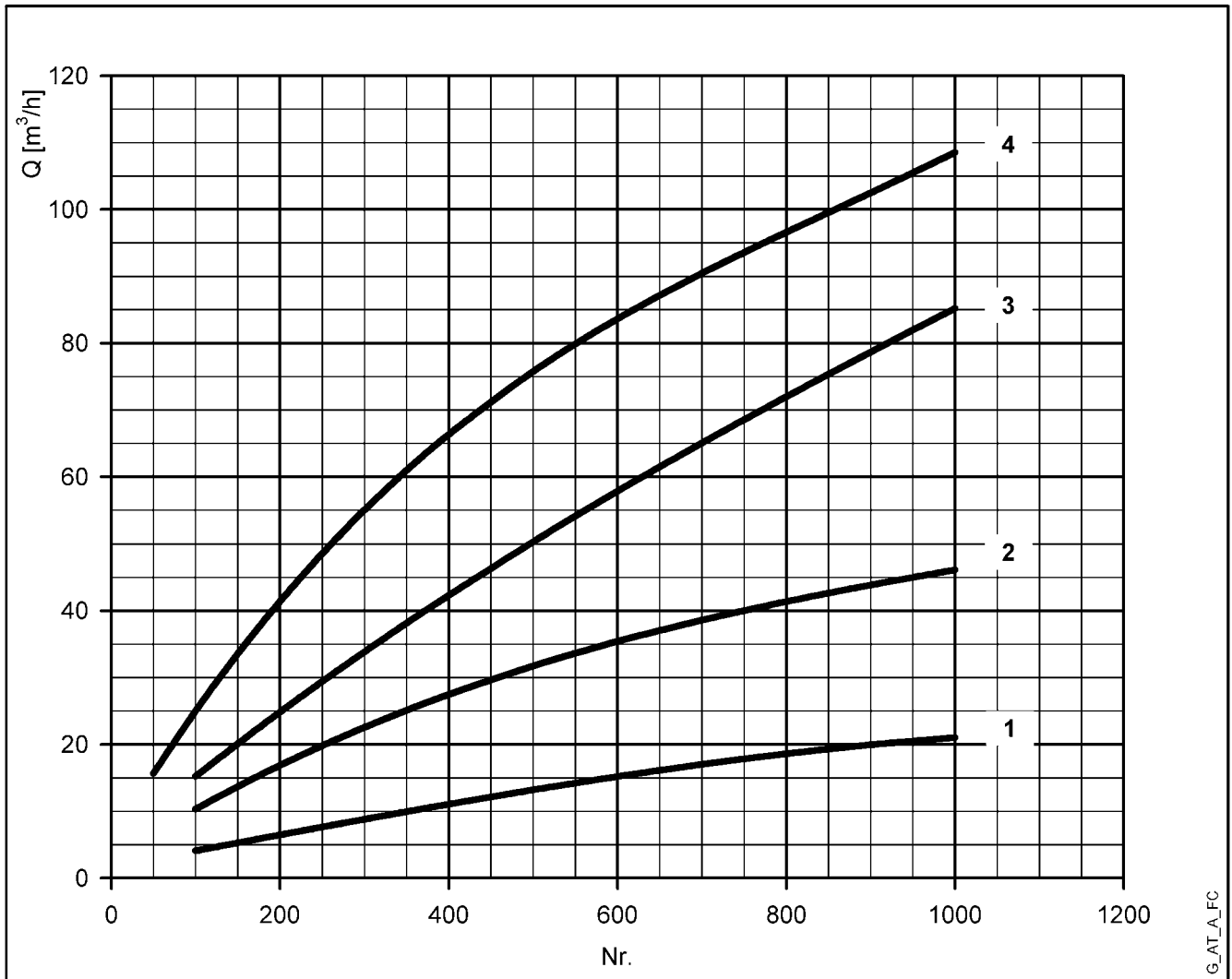
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### WATER REQUIREMENTS FOR COMMUNITY BUILDINGS

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:

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

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 Pv 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 73-74 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  $\textcircled{1}$  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.



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

t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps 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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## TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

FLOW RATE		NOMINAL DIAMETER in mm and INCHES																		
m <sup>3</sup> /h	l/min	15	20	25	32	40	50	65	80	100	125	150	175	200	250	300	350	400		
		1/2"	3/4"	1"	1 1/4"	1 1/2"	2	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"		
0,6	10	v	0,94	0,53	0,34	0,21	0,13													
		hr	16	3,94	1,33	0,40	0,13													
0,9	15	v	1,42	0,80	0,51	0,31	0,20													
		hr	33,9	8,35	2,82	0,85	0,29													
1,2	20	v	1,89	1,06	0,68	0,41	0,27	0,17												
		hr	57,7	14,21	4,79	1,44	0,49	0,16												
1,5	25	v	2,36	1,33	0,85	0,52	0,33	0,21												
		hr	87,2	21,5	7,24	2,18	0,73	0,25												
1,8	30	v	2,83	1,59	1,02	0,62	0,40	0,25												
		hr	122	30,1	10,1	3,05	1,03	0,35												
2,1	35	v	3,30	1,86	1,19	0,73	0,46	0,30												
		hr	162	40,0	13,5	4,06	1,37	0,46												
2,4	40	v		2,12	1,36	0,83	0,53	0,34	0,20											
		hr		51,2	17,3	5,19	1,75	0,59	0,16											
3	50	v		2,65	1,70	1,04	0,66	0,42	0,25											
		hr		77,4	26,1	7,85	2,65	0,89	0,25											
3,6	60	v		3,18	2,04	1,24	0,80	0,51	0,30											
		hr		108	36,6	11,0	3,71	1,25	0,35											
4,2	70	v		3,72	2,38	1,45	0,93	0,59	0,35											
		hr		144	48,7	14,6	4,93	1,66	0,46											
4,8	80	v		4,25	2,72	1,66	1,06	0,68	0,40											
		hr		185	62,3	18,7	6,32	2,13	0,59											
5,4	90	v			3,06	1,87	1,19	0,76	0,45	0,30										
		hr			77,5	23,3	7,85	2,65	0,74	0,27										
6	100	v			3,40	2,07	1,33	0,85	0,50	0,33										
		hr			94,1	28,3	9,54	3,22	0,90	0,33										
7,5	125	v			4,25	2,59	1,66	1,06	0,63	0,41										
		hr			142	42,8	14,4	4,86	1,36	0,49										
9	150	v				3,11	1,99	1,27	0,75	0,50	0,32									
		hr				59,9	20,2	6,82	1,90	0,69	0,23									
10,5	175	v				3,63	2,32	1,49	0,88	0,58	0,37									
		hr				79,7	26,9	9,07	2,53	0,92	0,31									
12	200	v				4,15	2,65	1,70	1,01	0,66	0,42									
		hr				102	34,4	11,6	3,23	1,18	0,40									
15	250	v				5,18	3,32	2,12	1,26	0,83	0,53	0,34								
		hr				154	52,0	17,5	4,89	1,78	0,60	0,20								
18	300	v					3,98	2,55	1,51	1,00	0,64	0,41								
		hr					72,8	24,6	6,85	2,49	0,84	0,28								
24	400	v					5,31	3,40	2,01	1,33	0,85	0,54	0,38							
		hr					124	41,8	11,66	4,24	1,43	0,48	0,20							
30	500	v					6,63	4,25	2,51	1,66	1,06	0,68	0,47							
		hr					187	63,2	17,6	6,41	2,16	0,73	0,30							
36	600	v					5,10	3,02	1,99	1,27	0,82	0,57	0,42							
		hr					88,6	24,7	8,98	3,03	1,02	0,42	0,20							
42	700	v					5,94	3,52	2,32	1,49	0,95	0,66	0,49							
		hr					118	32,8	11,9	4,03	1,36	0,56	0,26							
48	800	v					6,79	4,02	2,65	1,70	1,09	0,75	0,55							
		hr					151	42,0	15,3	5,16	1,74	0,72	0,34							
54	900	v					7,64	4,52	2,99	1,91	1,22	0,85	0,62							
		hr					188	52,3	19,0	6,41	2,16	0,89	0,42							
60	1000	v					5,03	3,32	2,12	1,36	0,94	0,69	0,53							
		hr					63,5	23,1	7,79	2,63	1,08	0,51	0,27							
75	1250	v					6,28	4,15	2,65	1,70	1,18	0,87	0,66							
		hr					96,0	34,9	11,8	3,97	1,63	0,77	0,40							
90	1500	v					7,54	4,98	3,18	2,04	1,42	1,04	0,80							
		hr					134	48,9	16,5	5,57	2,29	1,08	0,56							
105	1750	v					8,79	5,81	3,72	2,38	1,65	1,21	0,93							
		hr					179	65,1	21,9	7,40	3,05	1,44	0,75							
120	2000	v					6,63	4,25	2,72	1,89	1,39	1,06	0,68							
		hr					83,3	28,1	9,48	3,90	1,84	0,96	0,32							
150	2500	v					8,29	5,31	3,40	2,36	1,73	1,33	0,85							
		hr					126	42,5	14,3	5,89	2,78	1,45	0,49							
180	3000	v							6,37	4,08	2,83	2,08	1,59	1,02						
		hr							59,5	20,1	8,26	3,90	2,03	0,69						
210	3500	v							7,43	4,76	3,30	2,43	1,86	1,19	0,83					
		hr							79,1	26,7	11,0	5,18	2,71	0,91	0,38					
240	4000	v							8,49	5,44	3,77	2,77	2,12	1,36	0,94					
		hr							101	34,2	14,1	6,64	3,46	1,17	0,48					
300	5000	v								6,79	4,72	3,47	2,65	1,70	1,18					
		hr								51,6	21,2	10,0	5,23	1,77	0,73					
360	6000	v								8,15	5,66	4,16	3,18	2,04	1,42					
		hr								72,3	29,8	14,1	7,33	2,47	1,02					
420	7000	v									6,61	4,85	3,72	2,38	1,65	1,21				
		hr									39,6	18,7	9,75	3,29	1,35	0,64				
480	8000	v									7,55	5,55	4,25	2,72	1,89	1,39				
		hr									50,7	23,9	12,49	4,21	1,73	0,82				
540	9000	v									8,49	6,24	4,78	3,06	2,12	1,56	1,19			
		hr									63,0	29,8	15,5	5,24	2,16	1,02	0,53			
600	10000	v										6,93	5,31	3,40	2,36	1,73	1,33			
		hr										36,2	18,9	6,36	2,62	1,24	0,65			

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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	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
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

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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	Imp. gal. per minute Imp. gal./min	US gal. per minute Us gal./min
<b>1,0000</b>	0,0600	2,1189	0,0353	0,2200	0,2640
16,6667	<b>1,0000</b>	35,3147	0,5886	3,6660	4,4030
0,4720	0,0283	<b>1,0000</b>	0,0167	0,1040	0,1250
28,3170	1,6990	60,0000	<b>1,0000</b>	6,2290	7,4800
4,5460	0,2728	9,6326	0,1605	<b>1,0000</b>	1,2010
3,7850	0,2271	8,0209	0,1337	0,8330	<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 di mercury mm Hg
<b>1,0000</b>	0,0010	1 x 10 <sup>-5</sup>	1,45 x 10 <sup>-4</sup>	1,02 x 10 <sup>-4</sup>	0,0075
1000,0000	<b>1,0000</b>	0,0100	0,1450	0,1020	7,5000
1 x 10 <sup>5</sup>	100,0000	<b>1,0000</b>	14,5000	10,2000	750,1000
6895,0000	6,8950	0,0690	<b>1,0000</b>	0,7030	51,7200
9789,0000	9,7890	0,0980	1,4200	<b>1,0000</b>	73,4200
133,3000	0,1333	0,0013	0,0190	0,0140	<b>1,0000</b>

## LENGHT

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
1000,0000	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 litro	millilitre ml	imp. gallon imp. gal.	US gallon US gal.	cubic foot ft <sup>3</sup>
<b>1,0000</b>	1000,0000	1 x 10 <sup>6</sup>	220,0000	264,2000	35,3147
0,0010	<b>1,0000</b>	1000,0000	0,2200	0,2642	0,0353
1 x 10 <sup>-6</sup>	0,0010	<b>1,0000</b>	2,2 x 10 <sup>-4</sup>	2,642 x 10 <sup>-4</sup>	3,53 x 10 <sup>-5</sup>
0,0045	4,5460	4546,0000	<b>1,0000</b>	1,2010	0,1605
0,0038	3,7850	3785,0000	0,8327	<b>1,0000</b>	0,1337
0,0283	28,3170	28317,0000	6,2288	7,4805	<b>1,0000</b>

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# ITT

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