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SCUBA, GS Series

4" - 5" Submersible
Electric Pumps

50 Hz



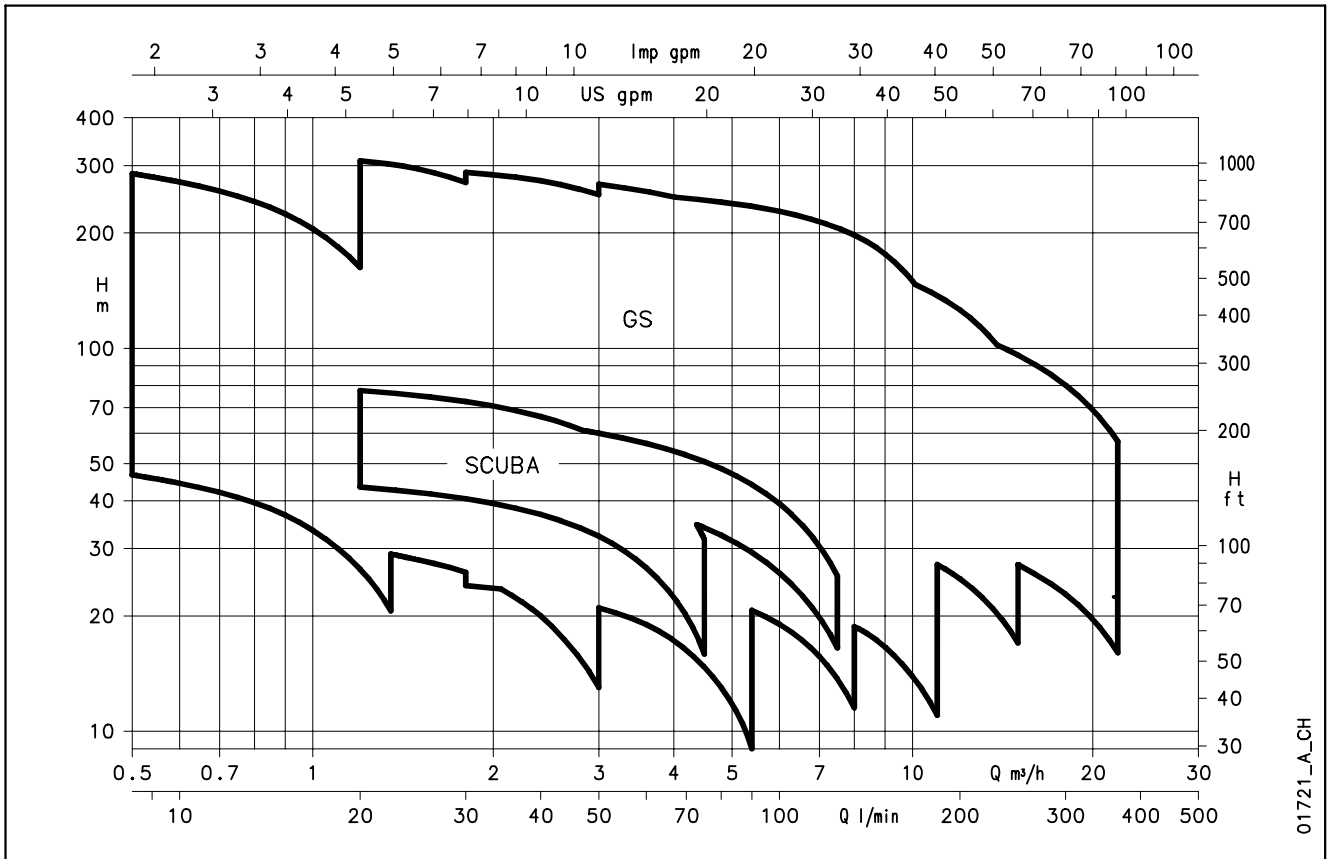
Engineered for life



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SCUBA - GS SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz





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Close-coupled Submersible Electric Pumps

SCUBA Series



MARKET SECTORS

CIVIL, AGRICULTURAL, INDUSTRIAL.

APPLICATIONS

- Water supply from primary water supply tanks or reservoirs, 6" wells, basins and watercourses.
- Sprinkler irrigation systems.
- Pressure boosting with pump directly inserted in tank or well, to avoid suction problems and noise.

- Maximum number of **starts per hour**, evenly distributed:
25 for motors up to 0,9 kW.
20 for motors 1,1 kW.
- Maximum **temperature** of water in contact with the motor: **40°C** (continuous use).

MANUFACTURING FEATURES

Single-phase range with pre-assembled float switch (SCUBA G series).

Kit including pump + Hydrovar®

Watercooled inverter available for the following models:

HVW/SC207T and HVW/SC407T.

On request, different voltages and frequencies.

- AISI 304 stainless steel impellers available on request.

CONSTRUCTION CHARACTERISTICS

- Close-coupled, multiple impeller submersible electric pump. The liquid end is located underneath the electric motor, which is cooled by the pumped liquid.
- Impellers are radial centrifugal type, made of technopolymer.
- AISI 304 stainless steel diffusers.
- Outer sleeve, motor casing, suction screen and shaft extension are made of AISI 304 stainless steel.
- **Dry motor.**
The electric motor is protected by a double seal system with an oil chamber. The silicon carbide mechanical seal, highly resistant to abrasion and wear, together with the second mechanical seal, lubricated thanks to the special configuration of the oil chambers, guarantee long-lasting reliability. The oil used is according to standard for oils in contact with foodstuffs (F.D.A. - FOOD AND DRUG ADMINISTRATION).

SPECIFICATIONS

PUMP

- **Delivery:** up to 7,5 m³/h at 2850 rpm.
- **Head:** up to 80 m at 2850 rpm.
- Maximum overall **diameter** of electric pump: 128 mm.
- **Maximum** immersion depth: 20 m.
- **Maximum** permissible quantity of suspended sand: 25 g/m³.
- **Passes** solids up to 2,5 mm.
- **Delivery** port: Rp 1 1/4.
- **Motor power** : 0,55 to 1,1 kW.

MOTOR

- **Single-phase version:**
220-240 V, 50 Hz 2 poles (2850 rpm).
- With built-in automatic reset overload protection.
- With built-in capacitor.
- **Three-phase version:**
380-415 V, 50 Hz 2 poles (2850 rpm); overload protection to be provided by user and installed in the control panel (see electric panel section).
- Maximum supply **voltage variations:** ±5%.
- **Classe F** insulation.
- Can also operate in **horizontal position.**

Innovative

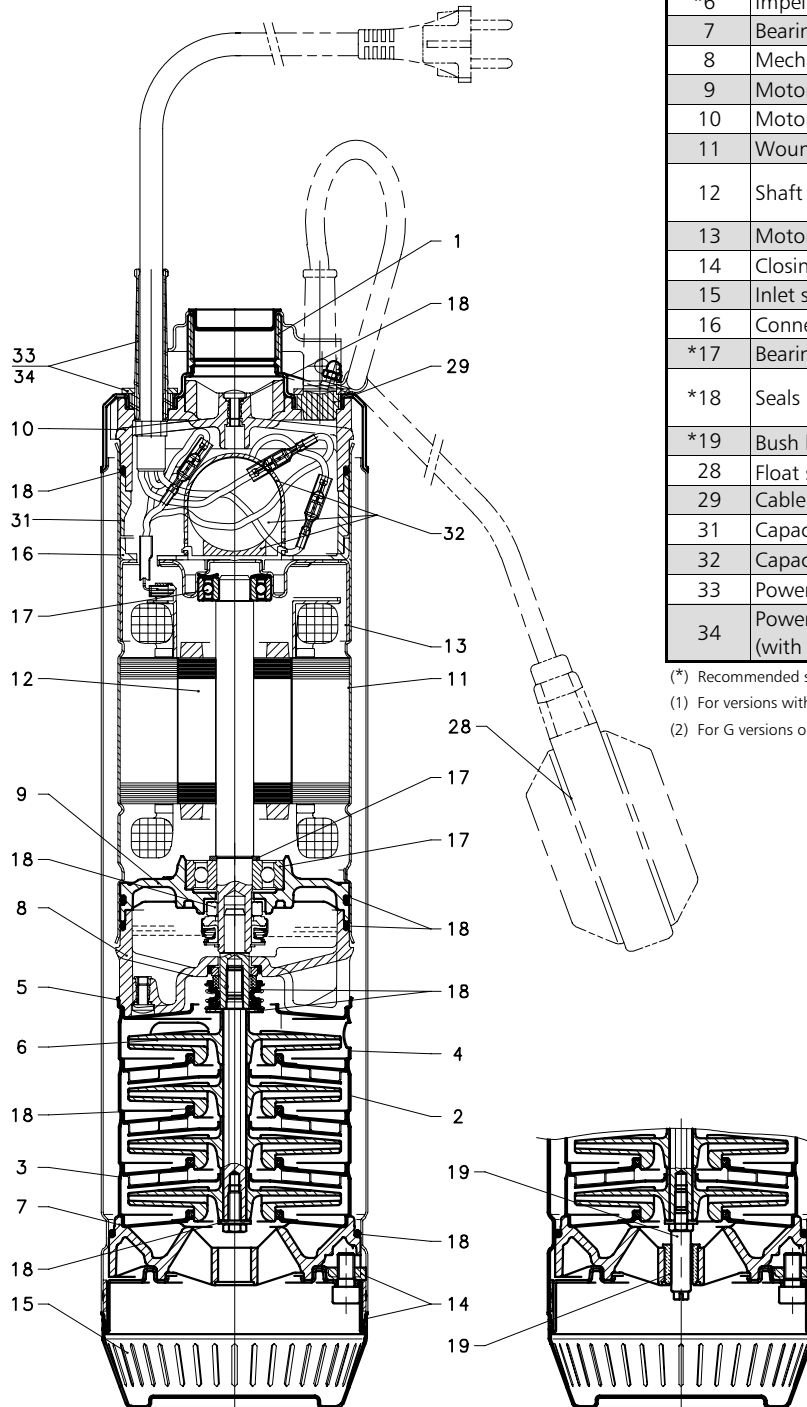
Compact

With Double seal system

Easy to install



SCUBA SERIES PUMP SECTION AND LIST OF MAIN COMPONENTS



REF. N.	DESCRIPTION
1	Outer sleeve
*2	Diffuser
*3	Initial bowl
*4	Final diffuser
*5	Final bowl
*6	Impeller
7	Bearing spider
8	Mech seal housing
9	Motor lower bearing bracket
10	Motor head
11	Wound stator
12	Shaft kit (motor pump shaft + bearings)
13	Motor upper bearing bracket
14	Closing flange kit
15	Inlet strainer
16	Connection container
*17	Bearings kit
*18	Seals kit
*19	Bush kit ⁽¹⁾
28	Float switch kit ⁽²⁾
29	Cable entry plug kit
31	Capacitor housing spacer
32	Capacitor
33	Power cable three-phase kit
34	Power cable single-phase kit (with plug)

(*) Recommended spare parts scuba-2p50-en_b_tp

(1) For versions with more than 4 impellers

(2) For G versions only

**SCUBA SERIES
TABLE OF MATERIALS**

NAME	MATERIAL	REFERENCE STANDARDS	
		EUROPE	USA
Sleeve with head	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Upper bearing support	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Sleeve with wound stator	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Strainer	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Shaft extension	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
Screws	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Impeller	Noryl®		
Diffuser	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Head	PPS Ryton®		
Lower head	PPS Ryton®		
Lower bearing support	Die-cast aluminium		
Bush support	PPS Ryton®		
Bush bearing	Laripur®		
Elastomers	Nitrile rubber (NBR)		
External mechanical seal	Silicon carbide		
Internal mechanical seal (fixed part)	Steatite		
Internal mechanical seal (rotary part)	Carbo-graphite		

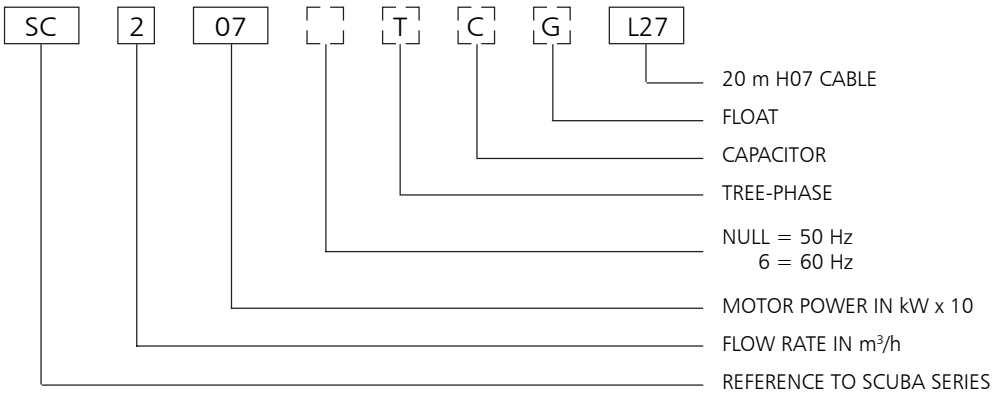
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SCUBA SERIES IDENTIFICATION CODES



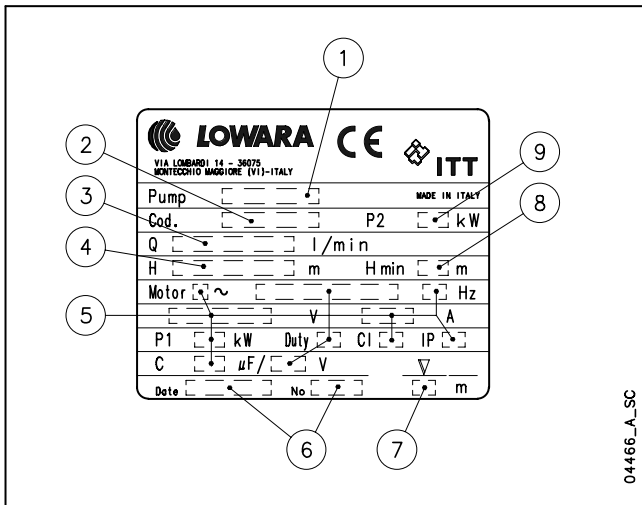
EXAMPLE : SC207CGL27

SCUBA PUMP :

FLOW RATE 2 m³/h; 0,75 kW; 50 Hz;

INTERNAL CAPACITOR; FLOAT; 20 m of H07 CABLE

SINGLE-PHASE RATING PLATE



THREE-PHASE RATING PLATE

LEGEND

1 - Electric pump type

2 - Code

3 - Delivery range

4 - Head range

5 - Characteristics motor

6 - Manufacturing data and serial number

7 - Maximum immersion depth

8 - Minimum head

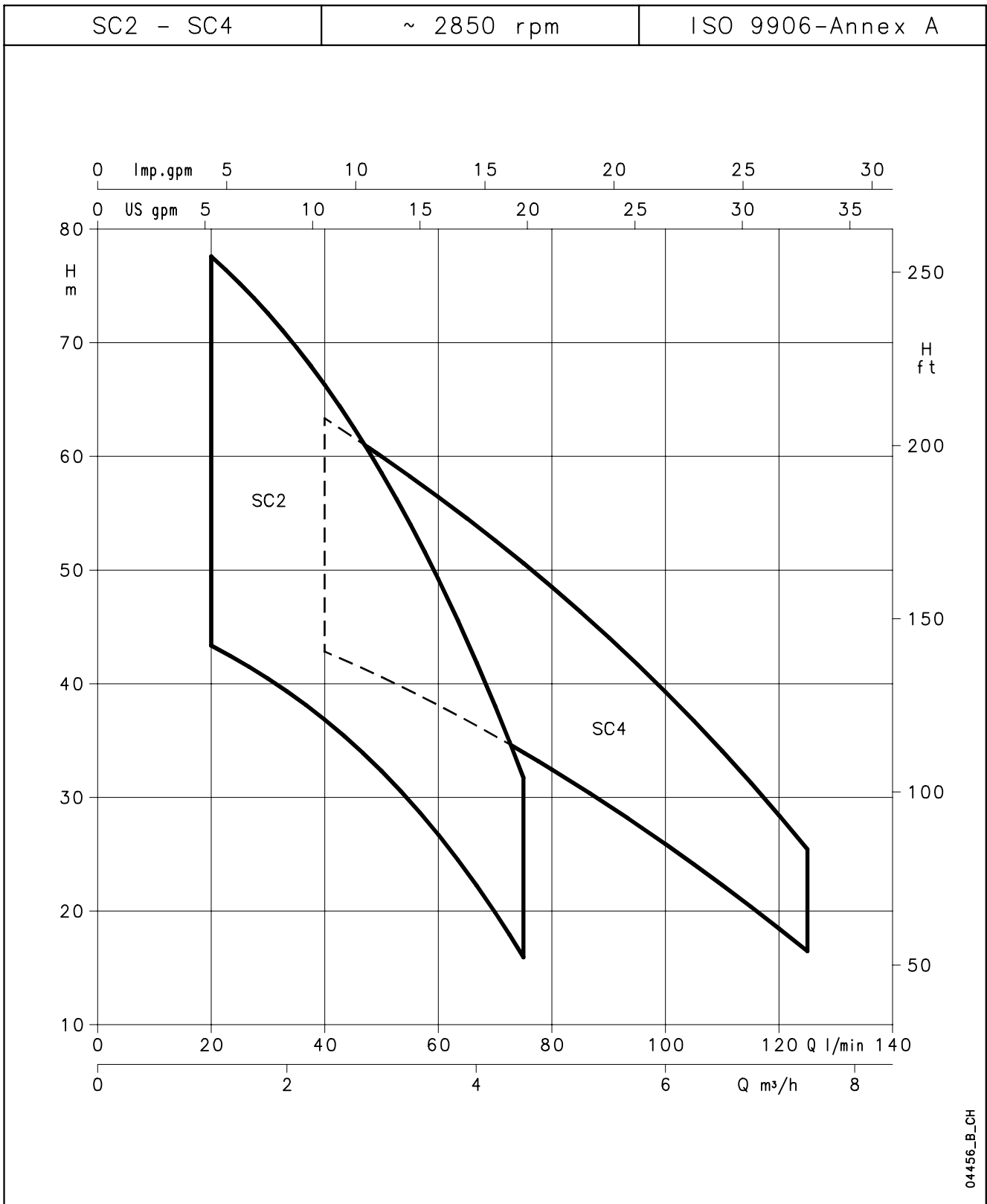
9 - Rated output



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SCUBA SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz



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SCUBA SERIES DIMENSIONS AND WEIGHTS AT 50 Hz

PUMP TYPE		N° OF STAGES	DIMENSIONS L mm	WEIGHT kg
SINGLE-PHASE	THREE-PHASE			
SC205C	SC205T	4	526	13,5
SC207C	SC207T	5	566	15
SC209C	SC209T	6	591	16
SC211C	SC211T	7	636	18
SC407C	SC407T	4	541	14,5
SC409C	SC409T	5	566	15,5
SC411C	SC411T	6	611	17,5

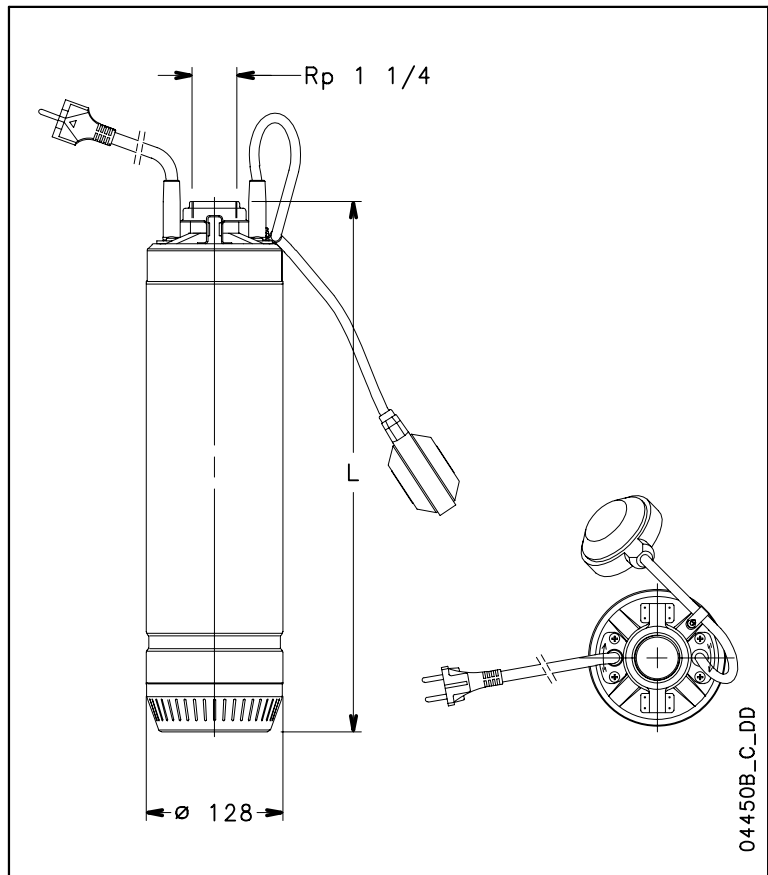
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PUMP TYPE	SECTION	CABLE TYPE	CABLE LENGHT
SC205C	3G1	H07RN-F	20 m
SC207C	3G1	H07RN-F	
SC209C	3G1,5	H07RN-F	
SC211C	3G1,5	H07RN-F	
SC407C	3G1	H07RN-F	
SC409C	3G1,5	H07RN-F	
SC411C	3G1,5	H07RN-F	
SC205T	4G1	H07RN-F	
SC207T	4G1	H07RN-F	
SC209T	4G1	H07RN-F	
SC211T	4G1	H07RN-F	
SC407T	4G1	H07RN-F	
SC409T	4G1	H07RN-F	
SC411T	4G1	H07RN-F	

scuba-sc2-sc4-2p50-en_c_tc

Single-phase range available with pre-assembled float (SCUBA G)

Versions with 10 meter cable available on request



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HYDRAULIC PERFORMANCE TABLE AT 50 Hz

PUMP TYPE	RATED POWER		Q = DELIVERY											
			l/min	0	20	30	40	50	60	75	80	100	125	
			m ³ /h	0	1,2	1,8	2,4	3	3,6	4,5	4,8	6	7,5	
kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER											
SC205C - SC205T	0,55	0,75	47,7	43,4	40,5	36,8	32,3	26,7	15,9					
SC207C - SC207T	0,75	1	61,2	56,7	52,7	47,6	41,5	34,3	21,7					
SC209C - SC209T	0,9	1,2	72,4	66,3	61,8	56,3	49,6	41,8	27,4					
SC211C - SC211T	1,1	1,5	84,5	77,6	72,6	66,3	58,6	49,2	31,7					
SC407C - SC407T	0,75	1	49,4			42,8	40,6	38,1	34,0	32,5	25,9	16,5		
SC409C - SC409T	0,9	1,2	62,5			52,3	49,6	46,7	41,8	40,1	32,2	19,9		
SC411C - SC411T	1,1	1,5	75,5			63,4	60,0	56,4	50,6	48,5	39,3	25,4		

scuba-sc2-sc4-2p50-en_c_th

PUMP TYPE	ABSORBED POWER*	ABSORBED POWER*	CAPACITOR
SINGLE-PHASE	kW	220-240 V A	µF / 450 V
SC205C	0,93	4,37	16
SC207C	1,15	5,19	25
SC209C	1,32	5,88	25
SC211C	1,63	7,25	30
SC407C	1,18	5,28	25
SC409C	1,38	6,17	25
SC411C	1,76	7,85	30

PUMP TYPE	ABSORBED POWER*	ABSORBED POWER*	ABSORBED POWER*
THREE-PHASE	kW	220-240 V A	380-415 V A
SC205T	0,86	2,81	1,62
SC207T	1,09	4,12	2,38
SC209T	1,27	4,40	2,54
SC211T	1,45	4,68	2,70
SC407T	1,12	4,16	2,40
SC409T	1,33	4,50	2,60
SC411T	1,59	4,94	2,85

*Maximum values within operating range-

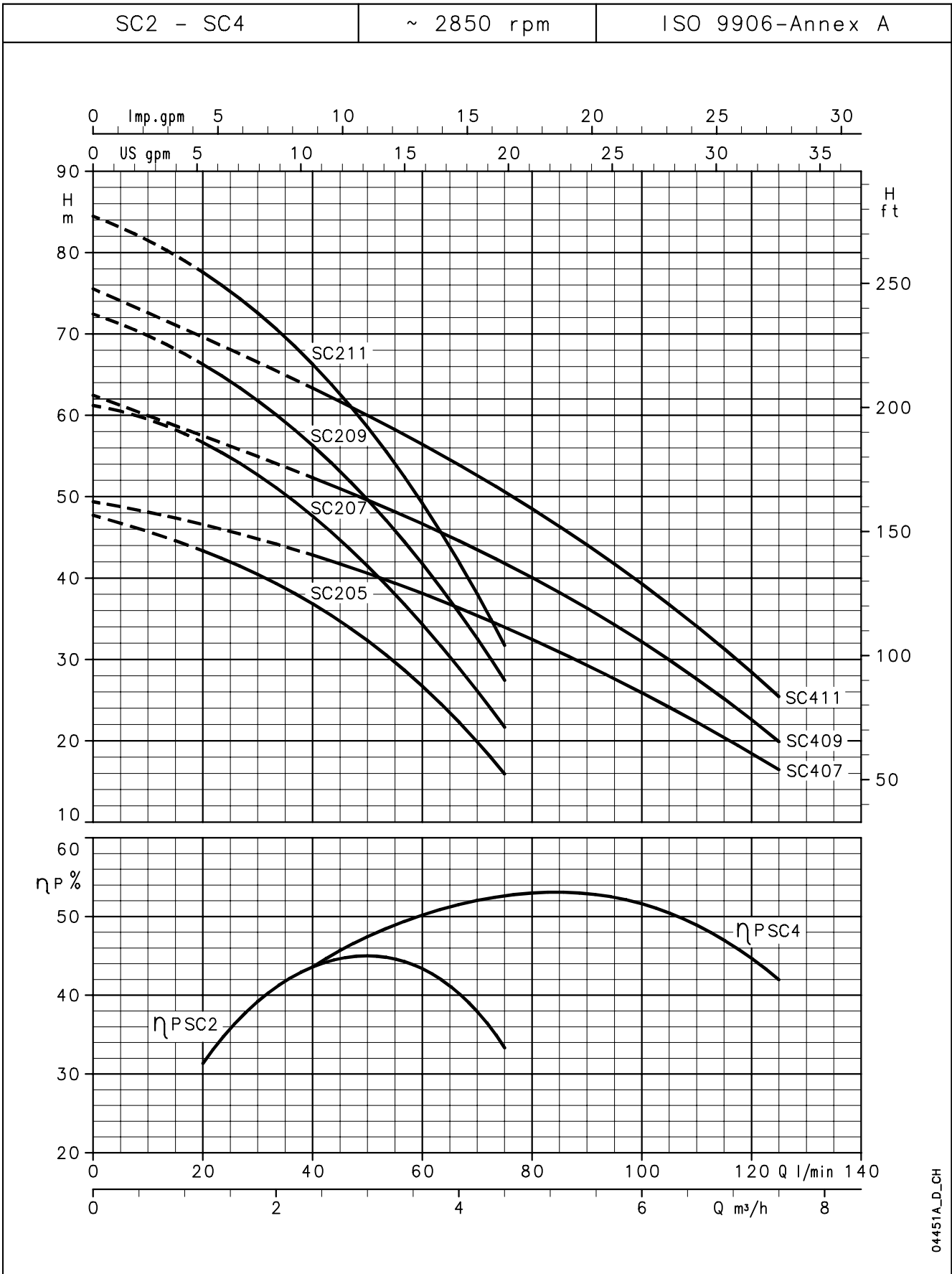
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SCUBA SERIES OPERATING CHARACTERISTICS AT 50 Hz

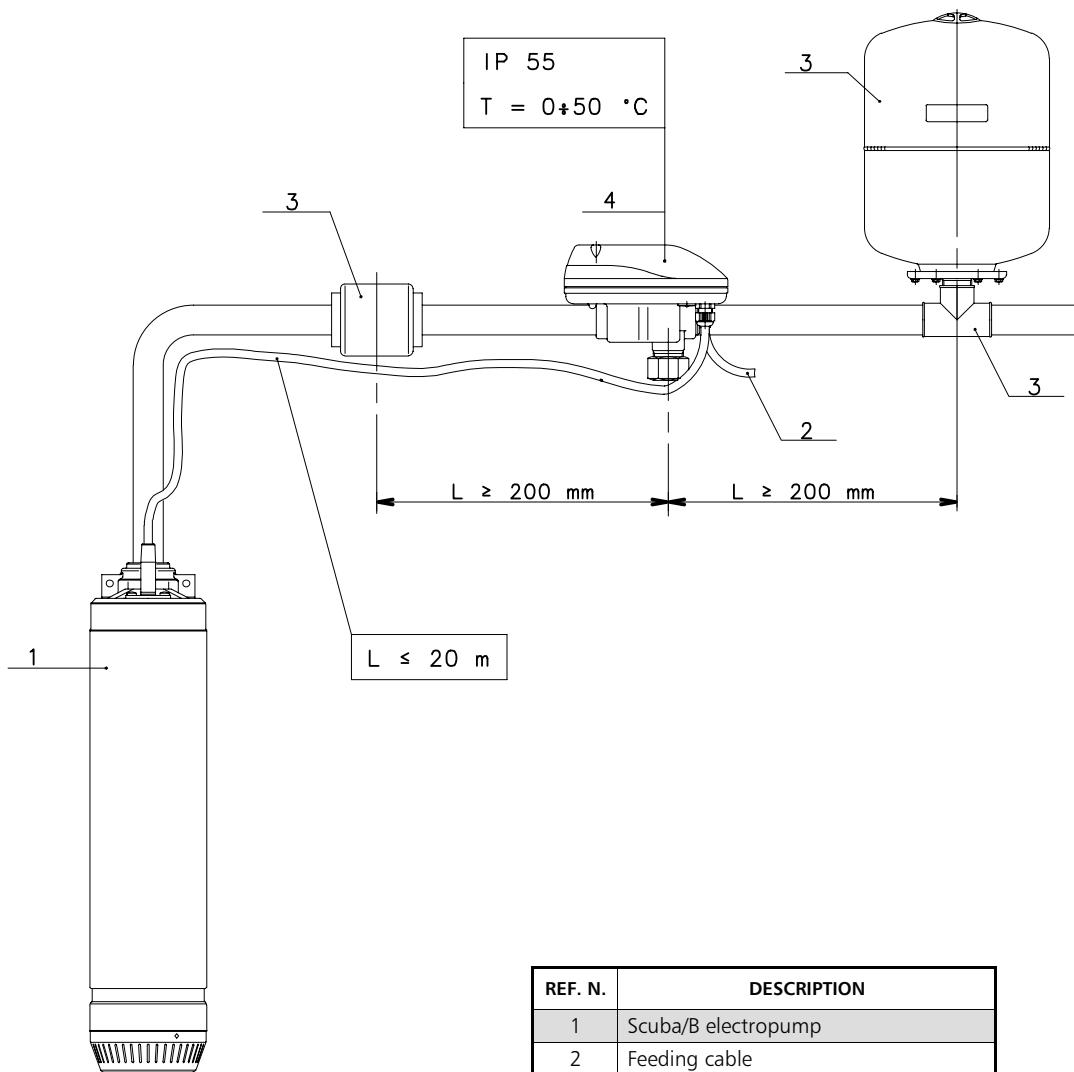


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These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.



EXAMPLE OF INSTALLATION OF A SCUBA PUMP CONTROLLED BY AN INVERTER (HYDROVAR® WATERCOOLED)



REF. N.	DESCRIPTION
1	Scuba/B electropump
2	Feeding cable
3	Hydraulic kit HVW
4	Hydrovar® Watercooled inverter

scuba-hvw-2p50-en_a_tp

4" Submersible Pumps

GS Series



- Compact**
- Sturdy**
- Abrasion resistant**
- All components are F.D.A. approved**
- Floating impellers**

MARKET SECTORS

CIVIL, AGRICULTURAL, INDUSTRIAL.

APPLICATIONS

- Water supply.
- Sprinkler irrigation.
- Pressure boosting.
- Fire-fighting.

SPECIFICATIONS

PUMP

- **Delivery:** up to 21 m³/h at 2850 rpm.
- **Head:** up to 340 m at 2850 rpm.
- Maximum pump overall **diameter** (cable cover included): 99 mm.
- **Maximum** immersion depth: 150 m (with 4OS motor), 300 m (with L4C motor).
- **Maximum** permissible quantity of sand: 150 g/m³.
- 1GSL - 2GS - 4GS - 6GS **versions** Rp 1 1/4 delivery port.
- 8GS - 12GS - 16GS **versions** Rp 2 delivery port.
- Motor **power** : from 0,37 to 7,5 kW.

MOTOR

- **4OS single-phase version:** from 0,37 to 2,2 kW 220-240 V, 50 Hz.
- **4OS three-phase version:** from 0,37 to 7,5 kW 220-240 V, 50 Hz. from 0,37 to 7,5 kW 380-415 V, 50 Hz.
- **L4C single-phase version:** from 0,37 to 4 kW 220-240 V, 50 Hz.
- **L4C three-phase version:** from 0,37 to 5,5 kW 220-240 V, 50 Hz. from 0,37 to 7,5 kW 380-415 V, 50 Hz.
- Overload protection to be provided by user and installed in the control panel (see electric panel section).
- Maximum supply **voltage variations:** ±-10% (4OS) ±6% (L4C).
- Maximum number of **starts per hour** evenly distributed: 30 (4OS), 40 (L4C).
- **Horizontal operation:** 4OS up to 2,2 kW. L4C up to 7,5 kW.
- Maximum **temperature** of water in contact with motor: **35°C** (4OS), **35°C** (L4C).

CONSTRUCTION CHARACTERISTICS PUMP

- Abrasion-resistant construction. The front wear plate, combined with the floating impellers, ensures optimum resistance to abrasion.
- The upper and lower supports are made of precision-cast stainless steel, ensuring resistance to corrosion, durability and a sturdy coupling to the motor.
- The hexagonal pump shaft guarantees an effective impeller driving.
- A stainless steel non-return valve is fitted in the discharge to prevent any back flow of water and alleviate any water hammer to the pump, thus safeguarding impellers and diffusers.
- The GS series pumps can be coupled to either the 4OS or L4C motors.

MOTOR

For the motor characteristics, please see the relevant motor section.

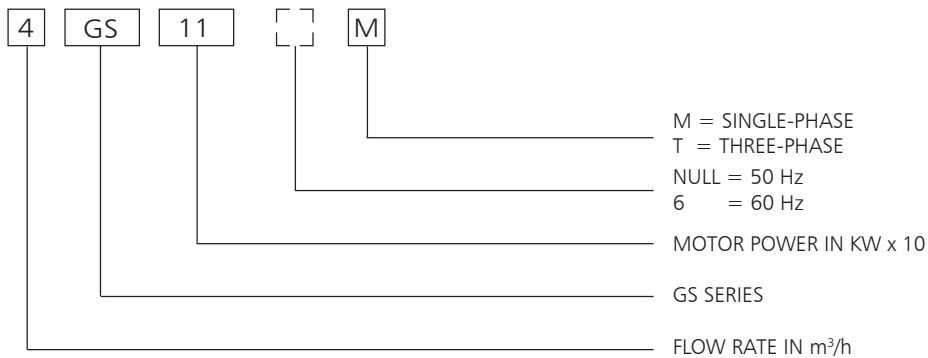
OPTIONAL FEATURES

- Different voltages and frequencies.

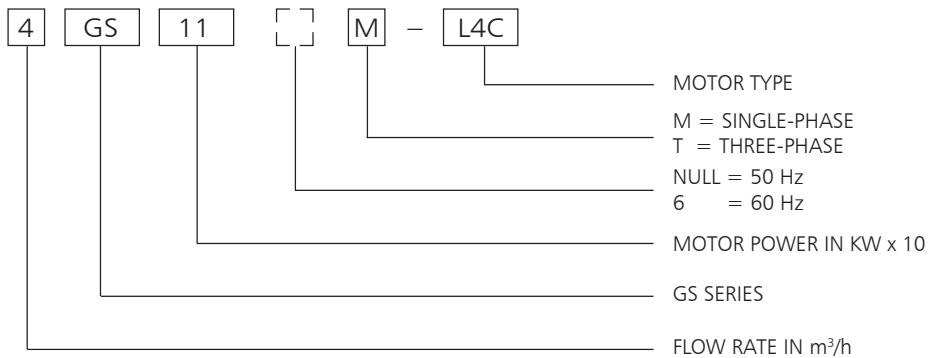
**GS SERIES
TABLE OF MATERIALS**

NAME	MATERIAL	REFERENCE STANDARDS	
		EUROPE	USA
Delivery port	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	CF-8 ASTM A743
Valve cap	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Valve support	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Valve gasket	Nitrile rubber (NBR)		
Valve locking ring	Stainless steel	DIN 17006 - X5CrNi18-7 (1.4319)	AISI 302
Upper support	Lexan®		
Bush bearing	Laripur®		
Split ring	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
Diffuser	Lexan®		
Impeller	Lexan®		
Stage housing	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Shim	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Pump shaft	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Outer sleeve	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Spacer	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Filter	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Adapter	Stainless steel	EN 10213-4-GX5CrNi19-10 (1.4308)	CF-8 ASTM A743
Coupling	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
Cable cover screw	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
Cable cover	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304

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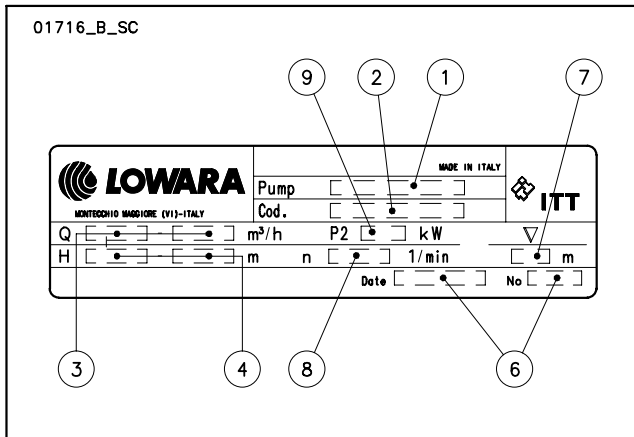
**GS SERIES
IDENTIFICATION CODE (PUMP)**


EXAMPLE : 4GS11M
GS pump series, flow rate of 4 m³/h, rated motor power 1,1 kW,
50 Hz version, single-phase.

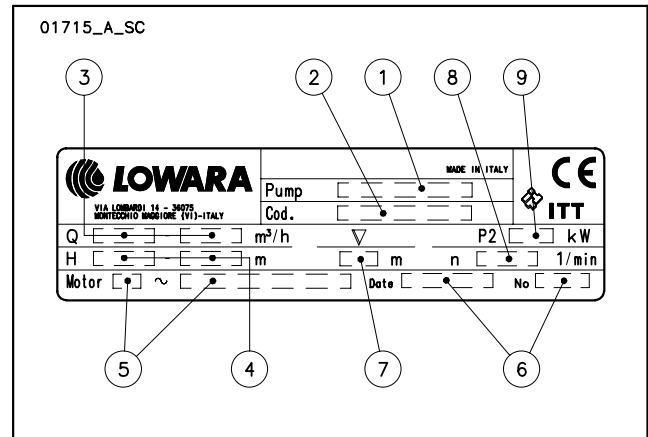
IDENTIFICATION CODE (ELECTRIC PUMP)


EXAMPLE : 4GS11M-L4C
GS electric pump series, flow rate of 4 m³/h, rated motor power 1,1 kW,
50 Hz version, single-phase, coupled to a 4" motor L4C.

GS SERIES RATING PLATE (PUMP)



RATING PLATE (ELECTRIC PUMP)

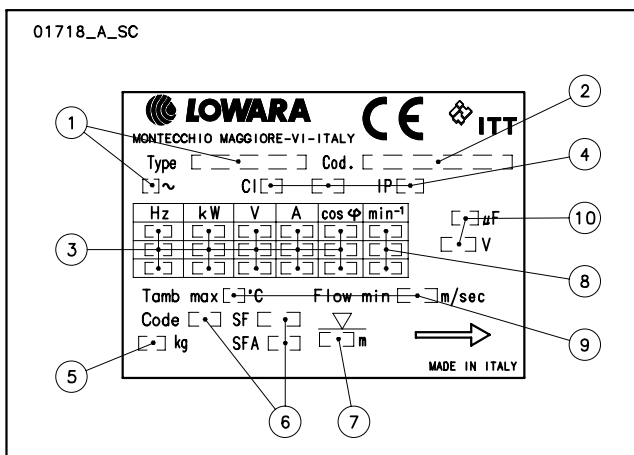


LEGEND

- 1 - Pump / electric pump type
- 2 - Code
- 3 - Delivery range
- 4 - Head range
- 5 - Characteristics motor

- 6 - Manufacturing data and serial number
- 7 - Maximum immersion depth
- 8 - Speed
- 9 - Rated output

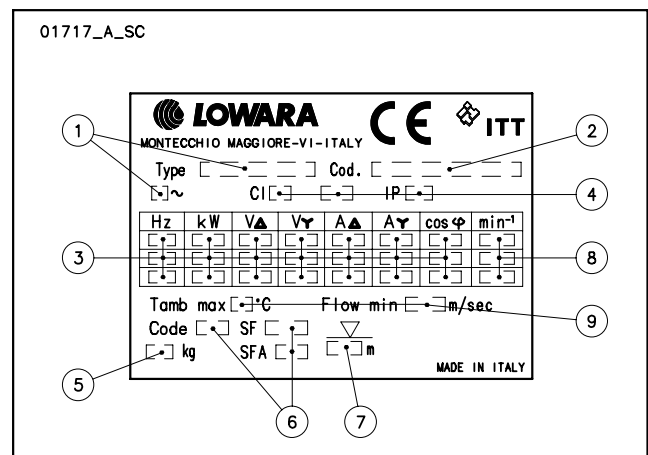
RATING PLATE (SINGLE-PHASE MOTOR)



LEGEND

- 1 - Motor type
- 2 - Code
- 3 - Electrical data
- 4 - Characteristics motor
- 5 - Motor weight

RATING PLATE (THREE-PHASE MOTOR)



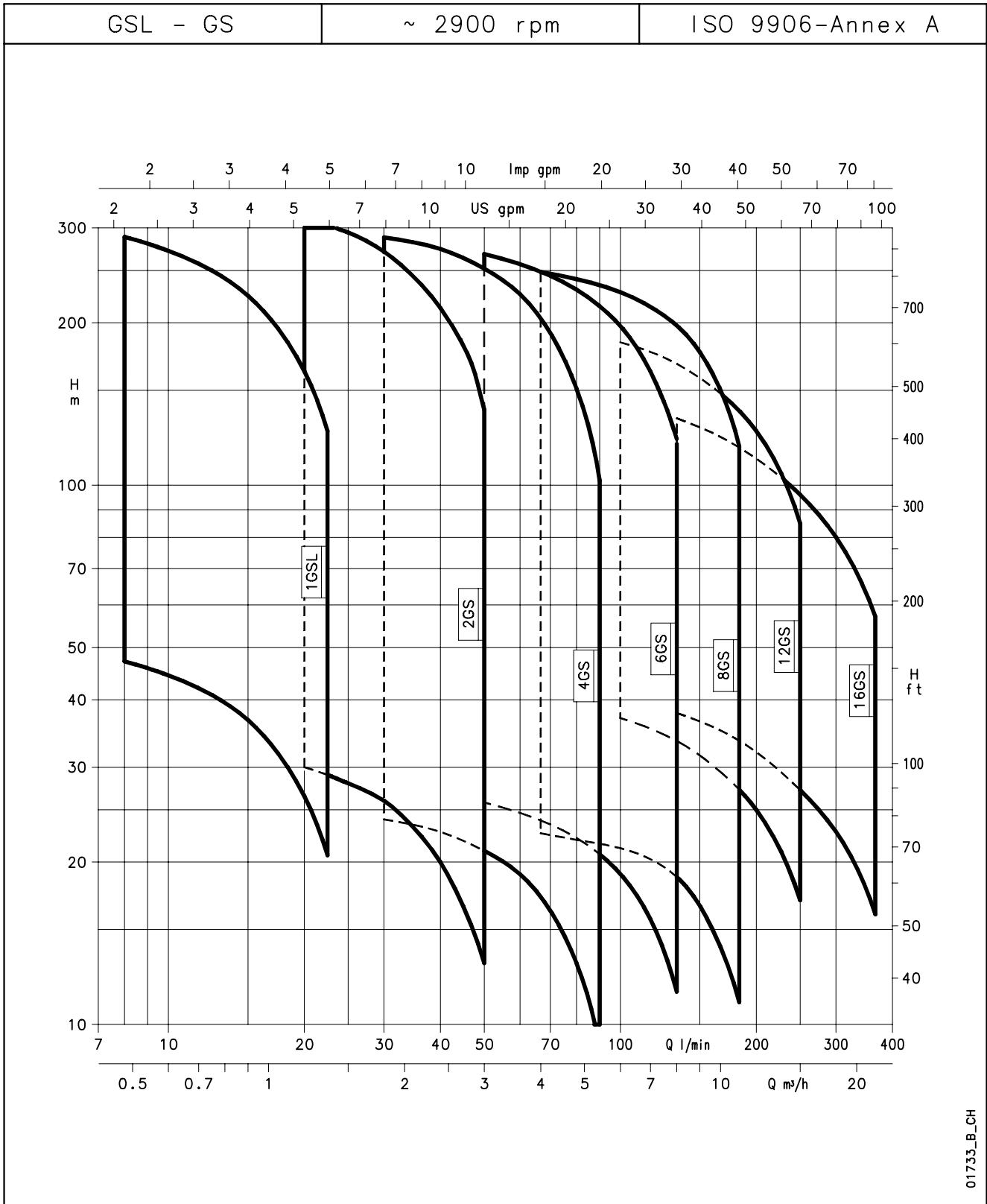
- 6 - Service factors
- 7 - Maximum immersion depth
- 8 - Speed
- 9 - Temperature and speed water
- 10 - Capacitor data



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GS SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz



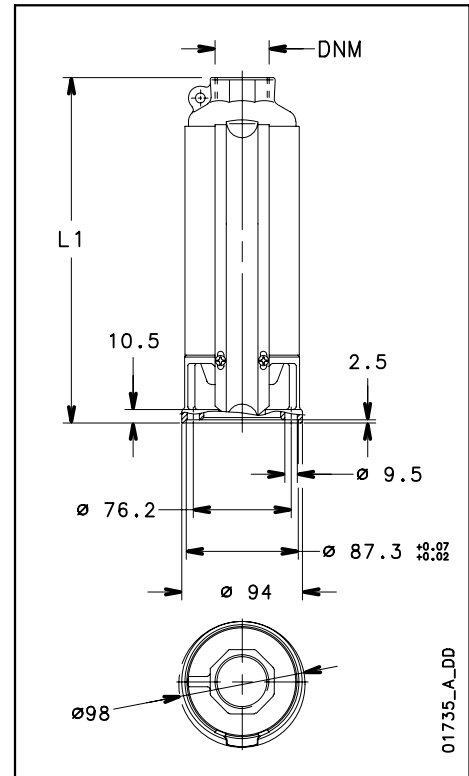
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1GSL SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	8,3	10	15	20	22,5
				m ³ /h	0	0,5	0,6	0,9	1,2	1,35
				H = TOTAL HEAD METRES COLUMN OF WATER						
1GSL02 ⁽¹⁾	8	0,37	0,5	53	46,6	45	37	27	20,6	
1GSL03	12	0,37	0,5	79,4	69,9	67	55	40	30,9	
1GSL05	18	0,55	0,75	119	105	100	83	60	46,3	
1GSL07	24	0,75	1	159	140	133	110	80	61,7	
1GSL11	35	1,1	1,5	232	204	194	160	116	90	
1GSL15	49	1,5	2	324	285	272	224	163	126	

(1) Maximum pump absorbed power: 0,25 kW - 0,33 HP.

1gsl-2p50-en_c_th

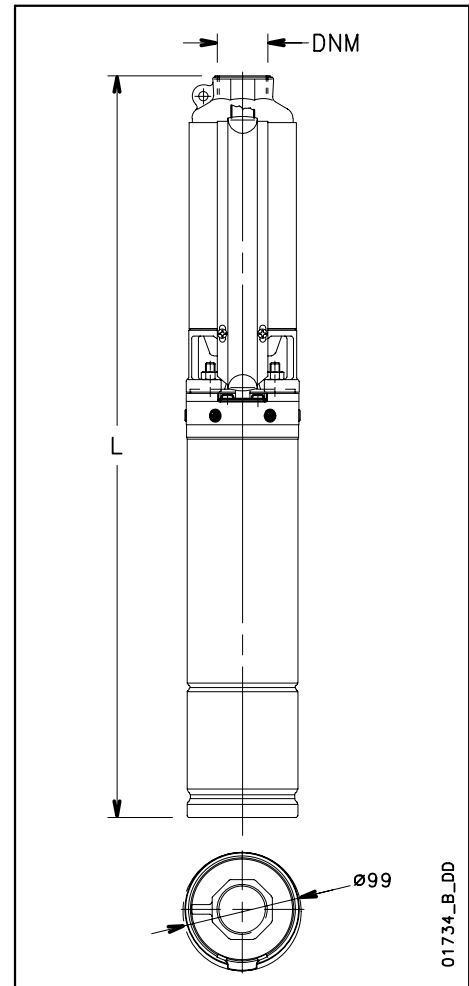


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1GSL..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
1GSL02M-4OS	8	Rp 1 1/4	298	651	3,1	10,7
1GSL03M-4OS	12	Rp 1 1/4	369	722	3,9	11,5
1GSL05M-4OS	18	Rp 1 1/4	472	825	4,9	13,1
1GSL07M-4OS	24	Rp 1 1/4	578	956	5,8	15,1
1GSL11M-4OS	35	Rp 1 1/4	824	1237	8,7	19,9
1GSL15M-4OS	49	Rp 1 1/4	1068	1516	11,8	24,6
1GSL03T-4OS	12	Rp 1 1/4	369	701	3,9	11
1GSL05T-4OS	18	Rp 1 1/4	472	825	4,9	12,5
1GSL07T-4OS	24	Rp 1 1/4	578	931	5,8	14
1GSL11T-4OS	35	Rp 1 1/4	824	1202	8,7	18
1GSL15T-4OS	49	Rp 1 1/4	1068	1481	11,8	23,2

1gsl-4os-2p50-en_a_td



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1GSL..L4C SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
1GSL02M-L4C	8	Rp 1 1/4	298	532	3,1	10,3
1GSL03M-L4C	12	Rp 1 1/4	369	603	3,9	11,2
1GSL05M-L4C	18	Rp 1 1/4	472	736	4,9	12,7
1GSL07M-L4C	24	Rp 1 1/4	578	862	5,8	14,2
1GSL11M-L4C	35	Rp 1 1/4	824	1153	8,7	19,6
1GSL15M-L4C	49	Rp 1 1/4	1068	1459	11,8	24,5
1GSL03T-L4C	12	Rp 1 1/4	369	583	3,9	10,9
1GSL05T-L4C	18	Rp 1 1/4	472	706	4,9	12,1
1GSL07T-L4C	24	Rp 1 1/4	578	842	5,8	13,6
1GSL11T-L4C	35	Rp 1 1/4	824	1108	8,7	17,1
1GSL15T-L4C	49	Rp 1 1/4	1068	1414	11,8	23,8

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

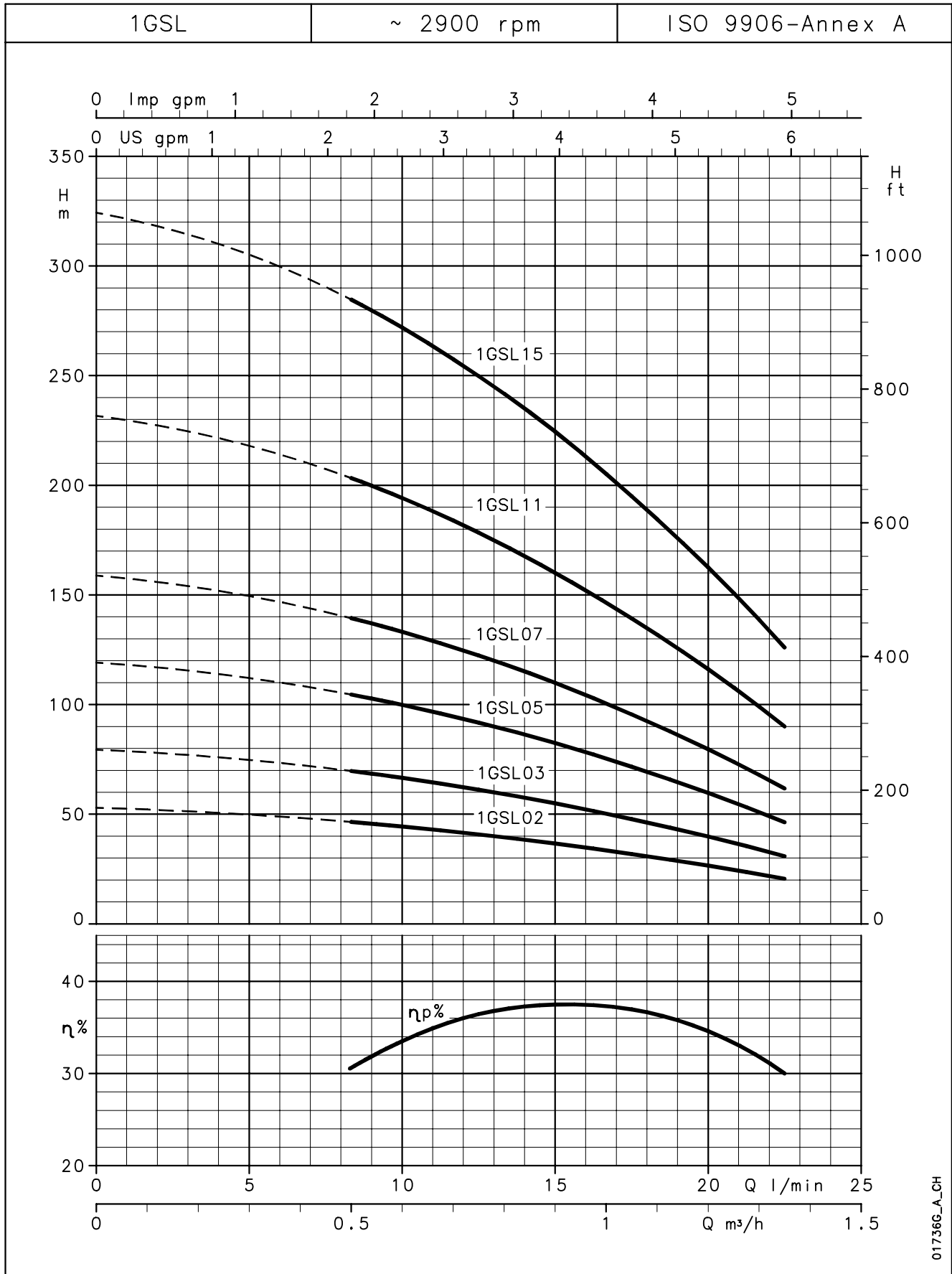
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1GSL SERIES OPERATING CHARACTERISTICS AT 50 Hz



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

2GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	20	25	30	40	50
				m ³ /h	0	1,2	1,5	1,8	2,4	3
				H = TOTAL HEAD METRES COLUMN OF WATER						
2GS02 ⁽¹⁾	5	0,37	0,5	33	30	28	26	20	13	
2GS03	7	0,37	0,5	47	42	40	36	29	19	
2GS05	10	0,55	0,75	67	60	56	52	41	27	
2GS07	14	0,75	1	93	83	79	73	57	37	
2GS11	20	1,1	1,5	133	119	113	104	82	53	
2GS15	28	1,5	2	187	167	158	146	115	74	
2GS22	40	2,2	3	267	238	226	208	164	106	
2GS30	52	3	4	347	309	294	271	213	138	

(1) Maximum pump absorbed power: 0,25 kW - 0,33 HP.

2gs-2p50-en_c_th

2GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			2GS02M-4OS	5		
2GS03M-4OS	7	Rp 1 1/4	280	633	2,9	10,5
2GS05M-4OS	10	Rp 1 1/4	332	685	3,5	11,7
2GS07M-4OS	14	Rp 1 1/4	402	780	4,2	13,5
2GS11M-4OS	20	Rp 1 1/4	507	920	5,3	16,5
2GS15M-4OS	28	Rp 1 1/4	680	1128	7,1	19,9
2GS22M-4OS	40	Rp 1 1/4	914	1412	10,1	25,2
2GS03T-4OS	7	Rp 1 1/4	280	612	2,9	10
2GS05T-4OS	10	Rp 1 1/4	332	685	3,5	11,1
2GS07T-4OS	14	Rp 1 1/4	402	755	4,2	12,4
2GS11T-4OS	20	Rp 1 1/4	507	885	5,3	14,6
2GS15T-4OS	28	Rp 1 1/4	680	1093	7,1	18,5
2GS22T-4OS	40	Rp 1 1/4	914	1362	10,1	23
2GS30T-4OS	52	Rp 1 1/4	1120	1568	12,2	26,1

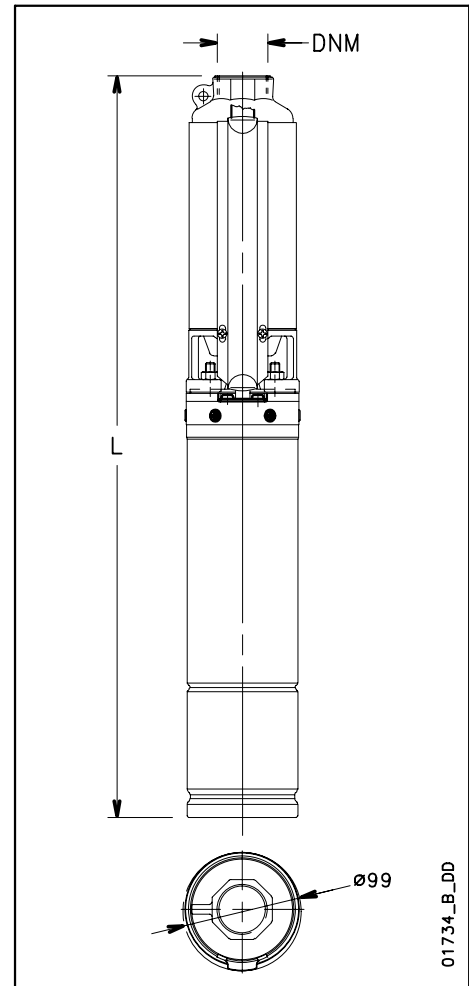
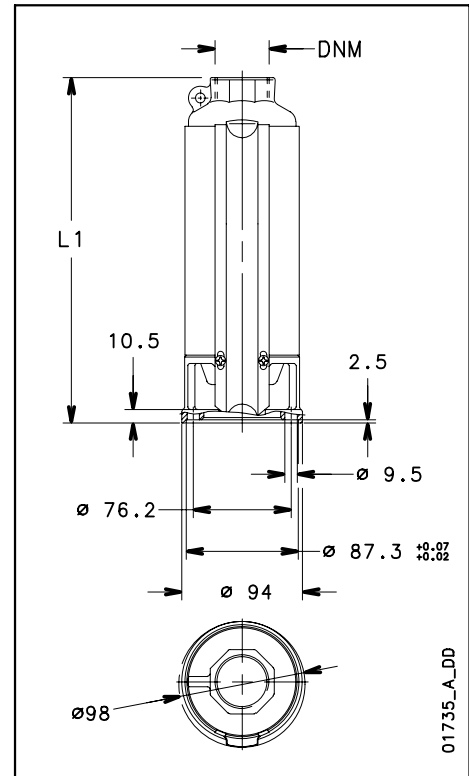
2gs-4os-2p50-en_a_td

2GS..L4C SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			2GS02M-L4C	5		
2GS03M-L4C	7	Rp 1 1/4	280	514	2,9	10,1
2GS05M-L4C	10	Rp 1 1/4	332	596	3,5	11,3
2GS07M-L4C	14	Rp 1 1/4	402	686	4,2	12,6
2GS11M-L4C	20	Rp 1 1/4	507	836	5,3	16,2
2GS15M-L4C	28	Rp 1 1/4	680	1071	7,1	19,8
2GS22M-L4C	40	Rp 1 1/4	914	1325	10,1	24,3
2GS03T-L4C	7	Rp 1 1/4	280	494	2,9	9,9
2GS05T-L4C	10	Rp 1 1/4	332	566	3,5	10,7
2GS07T-L4C	14	Rp 1 1/4	402	666	4,2	12
2GS11T-L4C	20	Rp 1 1/4	507	791	5,3	13,7
2GS15T-L4C	28	Rp 1 1/4	680	1026	7,1	19,1
2GS22T-L4C	40	Rp 1 1/4	914	1305	10,1	22,9
2GS30T-L4C	52	Rp 1 1/4	1120	1662	12,2	32,8

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

2gs-l4c-2p50-en_a_td

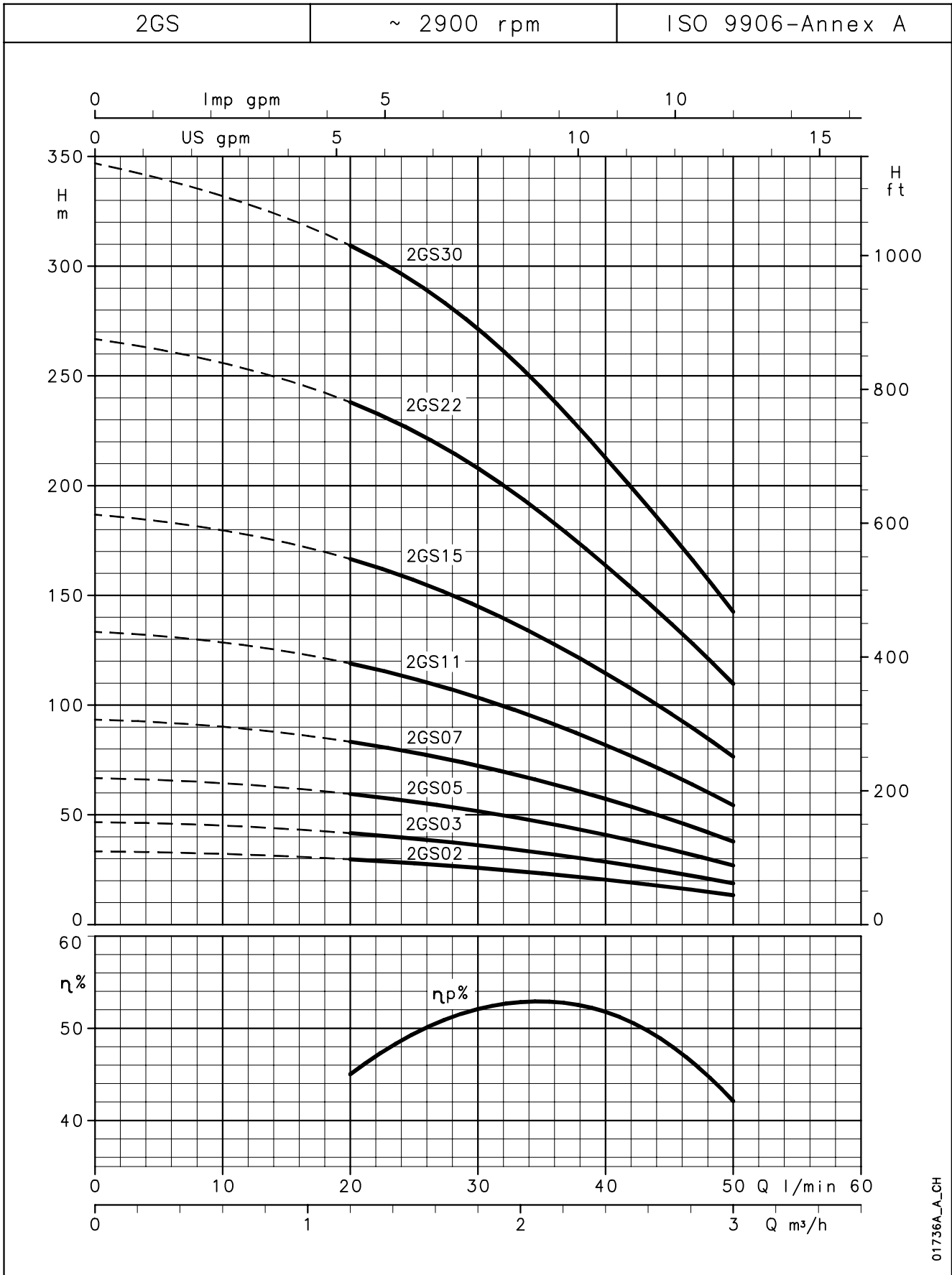




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2GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



01736A_A-CH

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

4GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	30	40	60	80	90
				m ³ /h	0	1,8	2,4	3,6	4,8	5,4
				H = TOTAL HEAD METRES COLUMN OF WATER						
4GS03M	4	0,37	0,5	27	24	23	19	13	9	
4GS05M	7	0,55	0,75	47	42	40	33	22	15	
4GS07M	9	0,75	1	60	54	51	42	28	19	
4GS11M	14	1,1	1,5	94	84	80	66	44	30	
4GS15M	19	1,5	2	127	114	108	89	60	40	
4GS22M	27	2,2	3	181	162	154	127	85	57	
4GS30T	35	3	4	228	204	194	160	107	72	
4GS40T	48	4	5,5	321	288	274	226	151	102	

4gs-2p50-en_b_th

4GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			4GS03M-4OS	4		
4GS05M-4OS	7	Rp 1 1/4	309	662	3,1	11,3
4GS07M-4OS	9	Rp 1 1/4	352	730	3,5	12,8
4GS11M-4OS	14	Rp 1 1/4	460	873	4,6	15,8
4GS15M-4OS	19	Rp 1 1/4	568	1016	5,7	18,5
4GS22M-4OS	27	Rp 1 1/4	770	1268	7,6	22,7
4GS03T-4OS	4	Rp 1 1/4	245	577	2,5	9,6
4GS05T-4OS	7	Rp 1 1/4	309	662	3,1	10,7
4GS07T-4OS	9	Rp 1 1/4	352	705	3,5	11,7
4GS11T-4OS	14	Rp 1 1/4	460	838	4,6	13,9
4GS15T-4OS	19	Rp 1 1/4	568	981	5,7	17,1
4GS22T-4OS	27	Rp 1 1/4	770	1218	7,6	20,5
4GS30T-4OS	35	Rp 1 1/4	967	1415	9,6	23,5
4GS40T-4OS	48	Rp 1 1/4	1248	1816	12,8	30,6

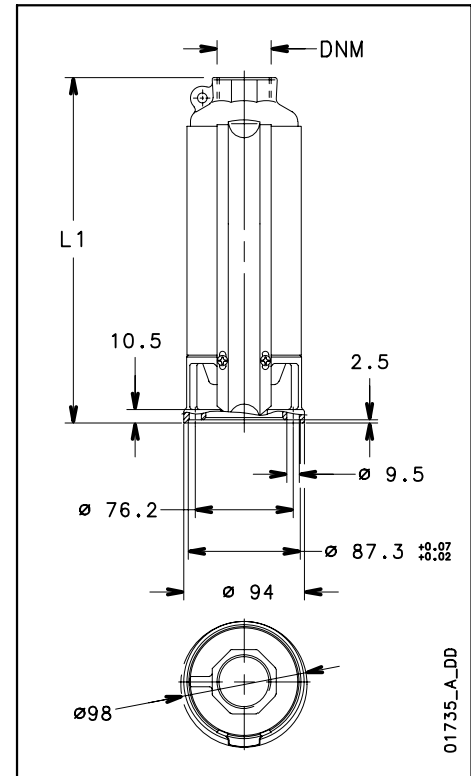
4gs-4os-2p50-en_a_td

4GS..L4C SERIES DIMENSIONS AND WEIGHTS

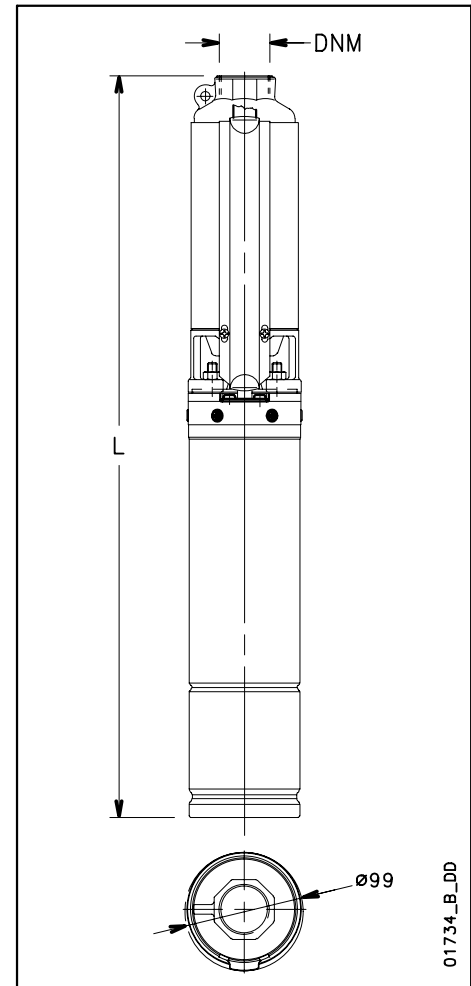
ELECTRO PUMP TYPE*	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			4GS03M-L4C	4		
4GS05M-L4C	7	Rp 1 1/4	309	573	3,1	10,9
4GS07M-L4C	9	Rp 1 1/4	352	636	3,5	11,9
4GS11M-L4C	14	Rp 1 1/4	460	789	4,6	15,5
4GS15M-L4C	19	Rp 1 1/4	568	959	5,7	18,4
4GS22M-L4C	27	Rp 1 1/4	770	1181	7,6	21,8
4GS03T-L4C	4	Rp 1 1/4	245	459	2,5	9,5
4GS05T-L4C	7	Rp 1 1/4	309	543	3,1	10,3
4GS07T-L4C	9	Rp 1 1/4	352	616	3,5	11,3
4GS11T-L4C	14	Rp 1 1/4	460	744	4,6	13
4GS15T-L4C	19	Rp 1 1/4	568	914	5,7	17,7
4GS22T-L4C	27	Rp 1 1/4	770	1161	7,6	20,4
4GS30T-L4C	35	Rp 1 1/4	967	1509	9,6	30,2
4GS40T-L4C	48	Rp 1 1/4	1248	1860	12,8	36,5

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

4gs-l4c-2p50-en_a_td



01735_A_DD



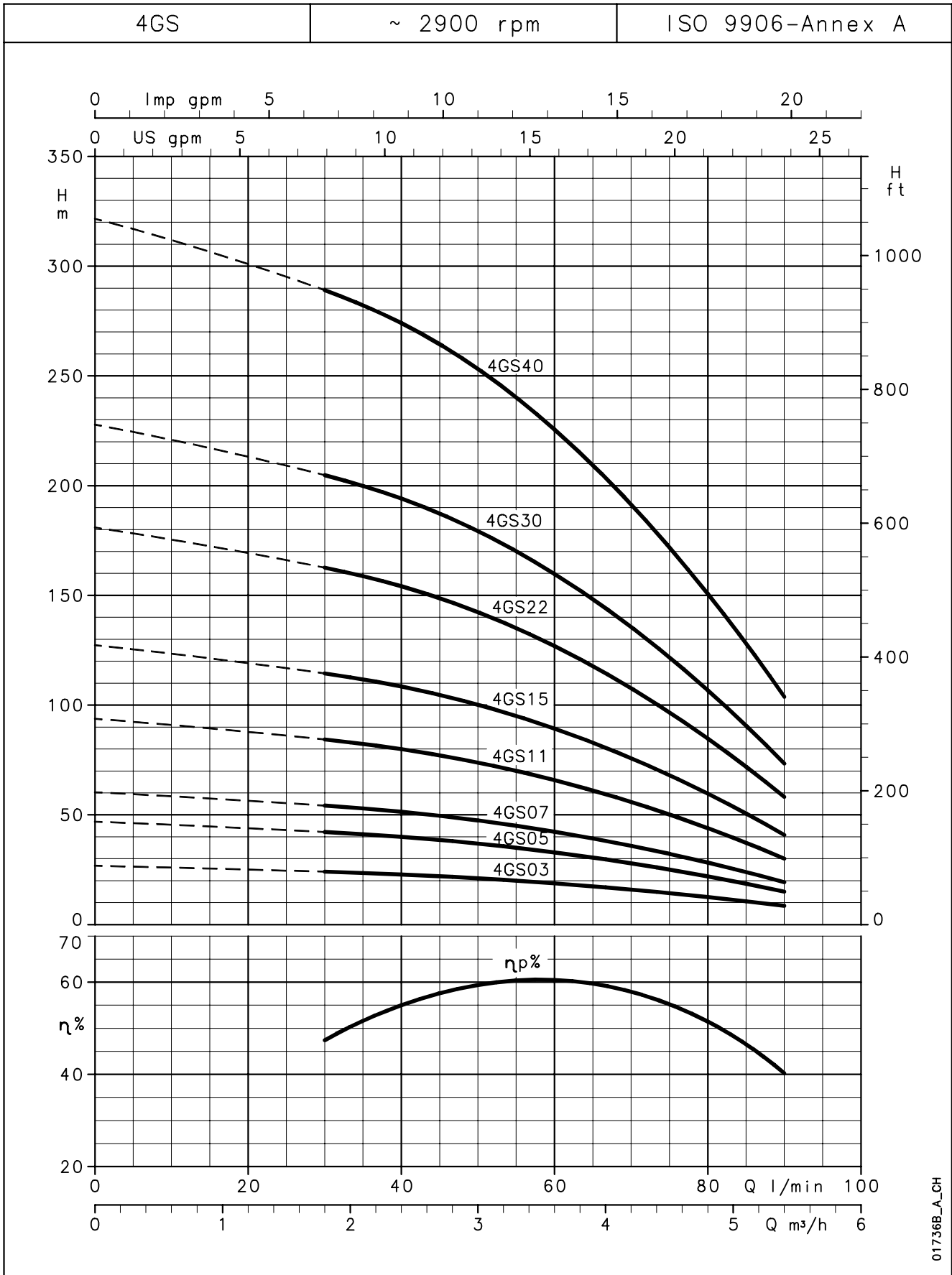
01734_B_DD



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4GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



017368_A-CH

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

6GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	50	70	90	110	133
				m ³ /h	0	3	4,2	5,4	6,6	8
				H = TOTAL HEAD METRES COLUMN OF WATER						
6GS05	5	0,55	0,75	30,5	25,8	23	21	17	11,5	
6GS07	7	0,75	1	42,7	36,1	33	29	24	16,1	
6GS11	10	1,1	1,5	61	51,6	47	41	34	23	
6GS15	14	1,5	2	85,4	72,2	66	58	48	32,2	
6GS22	21	2,2	3	128	108	99	87	71	48,3	
6GS30	29	3	4	177	150	136	120	99	66,7	
6GS40	38	4	5,5	232	196	179	157	129	87,4	
6GS55	52	5,5	7,5	317	268	244	215	177	120	

6gs-2p50-en_c_th

6GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			6GS05M-4OS	5		
6GS07M-4OS	7	Rp 1 1/4	390	768	4,2	13,5
6GS11M-4OS	10	Rp 1 1/4	485	898	5,1	16,3
6GS15M-4OS	14	Rp 1 1/4	645	1093	6,8	19,6
6GS22M-4OS	21	Rp 1 1/4	862	1360	9,1	24,2
6GS05T-4OS	5	Rp 1 1/4	329	682	3,5	11,1
6GS07T-4OS	7	Rp 1 1/4	390	743	4,2	12,4
6GS11T-4OS	10	Rp 1 1/4	485	863	5,1	14,4
6GS15T-4OS	14	Rp 1 1/4	645	1058	6,8	18,2
6GS22T-4OS	21	Rp 1 1/4	862	1310	9,1	22
6GS30T-4OS	29	Rp 1 1/4	1127	1575	11,8	25,7
6GS40T-4OS	38	Rp 1 1/4	1406	1974	14,7	32,5
6GS55T-4OS	52	Rp 1 1/4	1840	2468	19,3	40,6

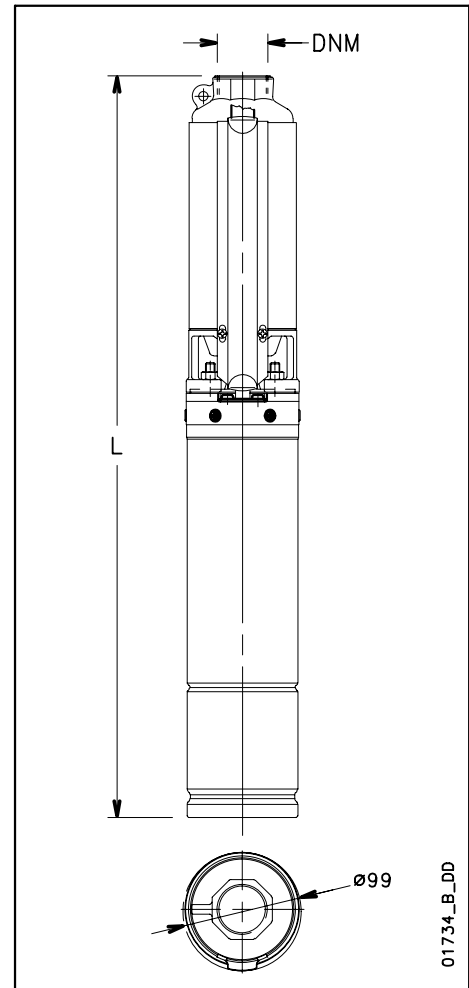
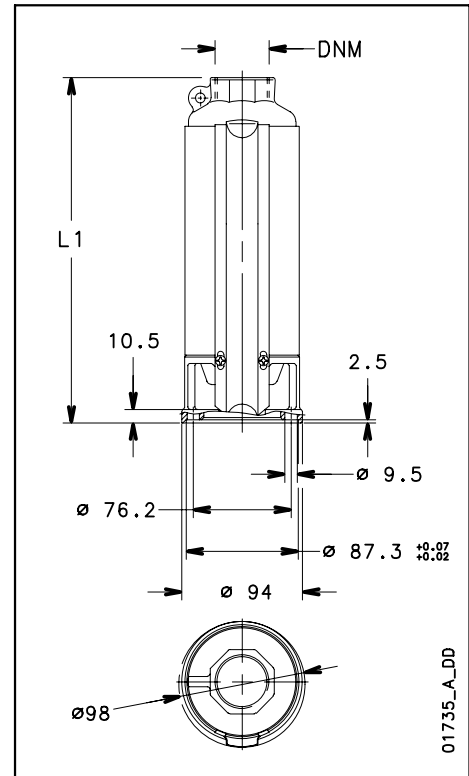
6gs-4os-2p50-en_a_td

6GS..L4C SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
			6GS05M-L4C	5		
6GS07M-L4C	7	Rp 1 1/4	390	674	4,2	12,6
6GS11M-L4C	10	Rp 1 1/4	485	814	5,1	16
6GS15M-L4C	14	Rp 1 1/4	645	1036	6,8	19,5
6GS22M-L4C	21	Rp 1 1/4	862	1273	9,1	23,3
6GS05T-L4C	5	Rp 1 1/4	329	563	3,5	10,7
6GS07T-L4C	7	Rp 1 1/4	390	654	4,2	12
6GS11T-L4C	10	Rp 1 1/4	485	769	5,1	13,5
6GS15T-L4C	14	Rp 1 1/4	645	991	6,8	18,8
6GS22T-L4C	21	Rp 1 1/4	862	1253	9,1	21,9
6GS30T-L4C	29	Rp 1 1/4	1127	1669	11,8	32,4
6GS40T-L4C	38	Rp 1 1/4	1406	2018	14,7	38,4
6GS55T-L4C	52	Rp 1 1/4	1840	2522	19,3	46,3

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

6gs-l4c-2p50-en_a_td

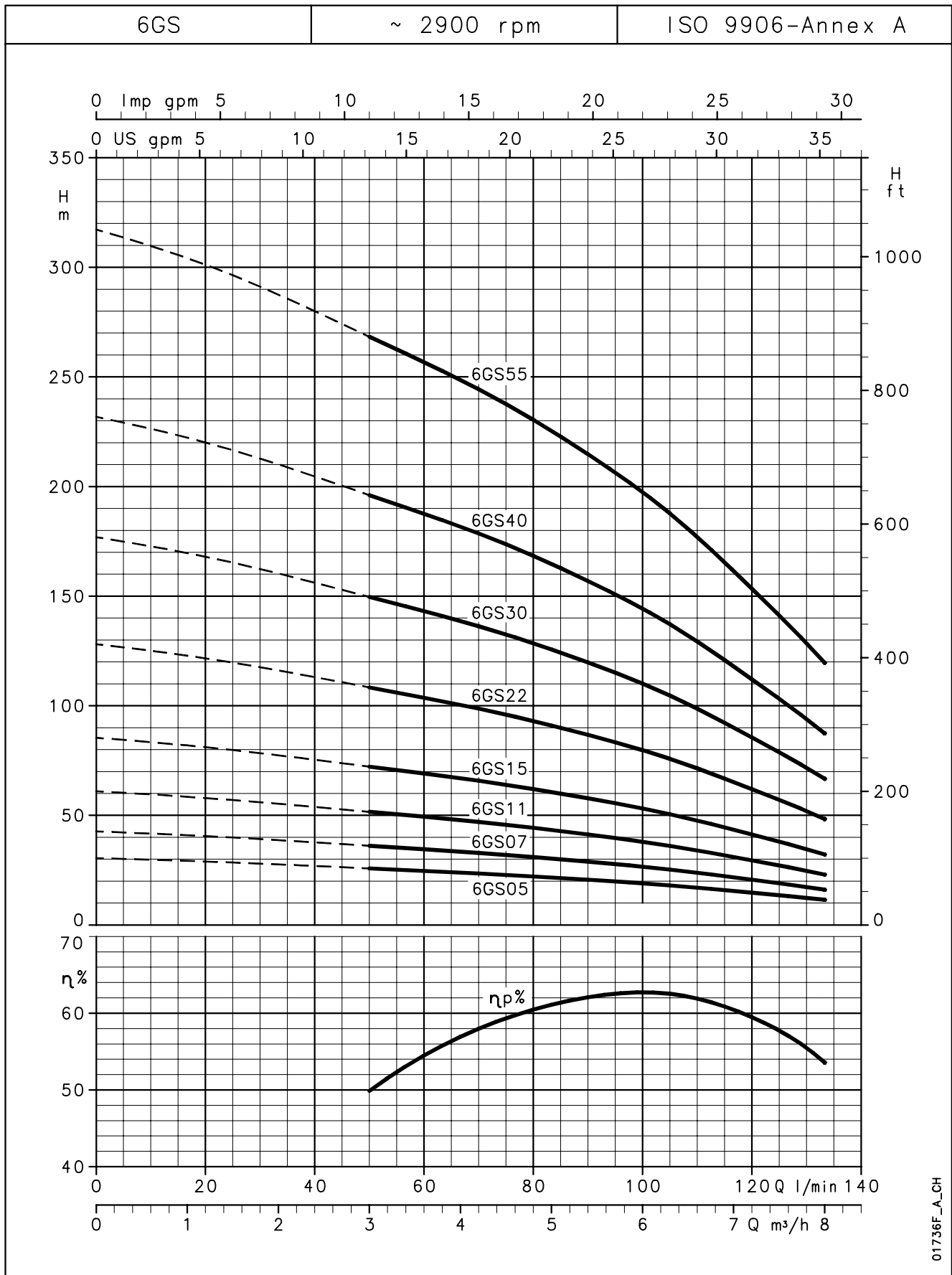




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6GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



01736F_A_CH

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

8GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	67	100	120	140	183
				m ³ /h	0	4	6	7,2	8,4	11
				H = TOTAL HEAD METRES COLUMN OF WATER						
		kW	HP							
8GS07	4	0,75	1	26	23	22	20	18	11	
8GS11	6	1,1	1,5	39	35	33	31	28	17	
8GS15	8	1,5	2	52	46	44	41	37	22	
8GS22	13	2,2	3	85	75	71	67	60	36	
8GS30	17	3	4	111	98	93	87	78	47	
8GS40	23	4	5,5	150	133	126	118	106	63	
8GS55	32	5,5	7,5	208	185	175	164	147	88	
8GS75	43	7,5	10	280	249	235	220	198	118	

8gs-2p50-en_c_th

8GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
8GS07M-4OS	4	Rp 2	299	677	3,2	12,5
8GS11M-4OS	6	Rp 2	361	774	3,8	15
8GS15M-4OS	8	Rp 2	423	871	4,5	17,3
8GS22M-4OS	13	Rp 2	580	1078	6	21,1
8GS07T-4OS	4	Rp 2	299	652	3,2	11,4
8GS11T-4OS	6	Rp 2	361	739	3,8	13,1
8GS15T-4OS	8	Rp 2	423	836	4,5	15,9
8GS22T-4OS	13	Rp 2	580	1028	6	18,9
8GS30T-4OS	17	Rp 2	740	1188	7,8	21,7
8GS40T-4OS	23	Rp 2	926	1494	9,6	27,4
8GS55T-4OS	32	Rp 2	1224	1852	12,8	34,1
8GS75T-4OS	43	Rp 2	1563	2397	16,2	45

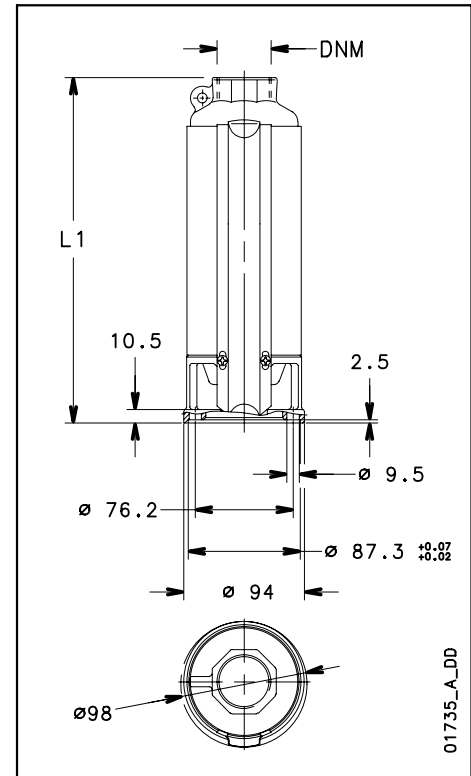
8gs-4os-2p50-en_a_td

8GS..L4C SERIES DIMENSIONS AND WEIGHTS

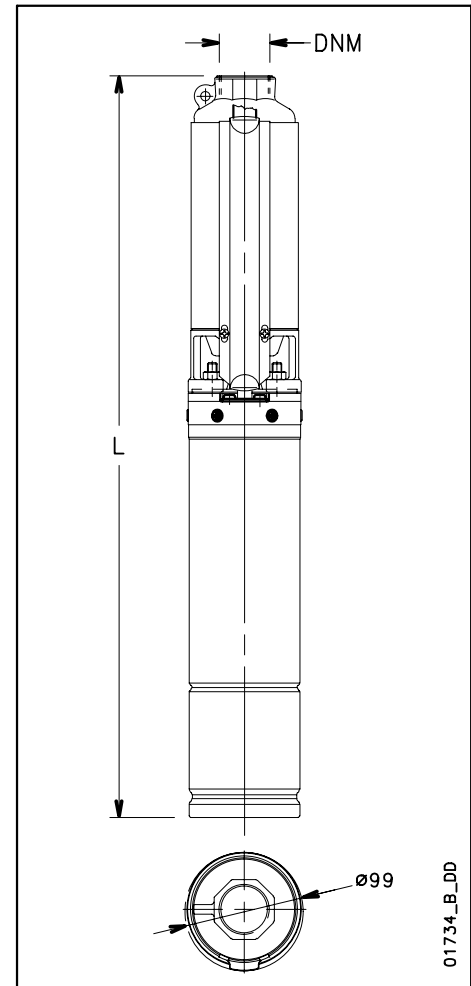
ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
8GS07M-L4C	4	Rp 2	299	583	3,2	11,6
8GS11M-L4C	6	Rp 2	361	690	3,8	14,7
8GS15M-L4C	8	Rp 2	423	814	4,5	17,2
8GS22M-L4C	13	Rp 2	580	991	6	20,2
8GS07T-L4C	4	Rp 2	299	563	3,2	11
8GS11T-L4C	6	Rp 2	361	645	3,8	12,2
8GS15T-L4C	8	Rp 2	423	769	4,5	16,5
8GS22T-L4C	13	Rp 2	580	971	6	18,8
8GS30T-L4C	17	Rp 2	740	1282	7,8	28,4
8GS40T-L4C	23	Rp 2	926	1538	9,6	33,3
8GS55T-L4C	32	Rp 2	1224	1906	12,8	39,8
8GS75T-L4C	43	Rp 2	1563	2325	16,2	45,4

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

8gs-l4c-2p50-en_a_td



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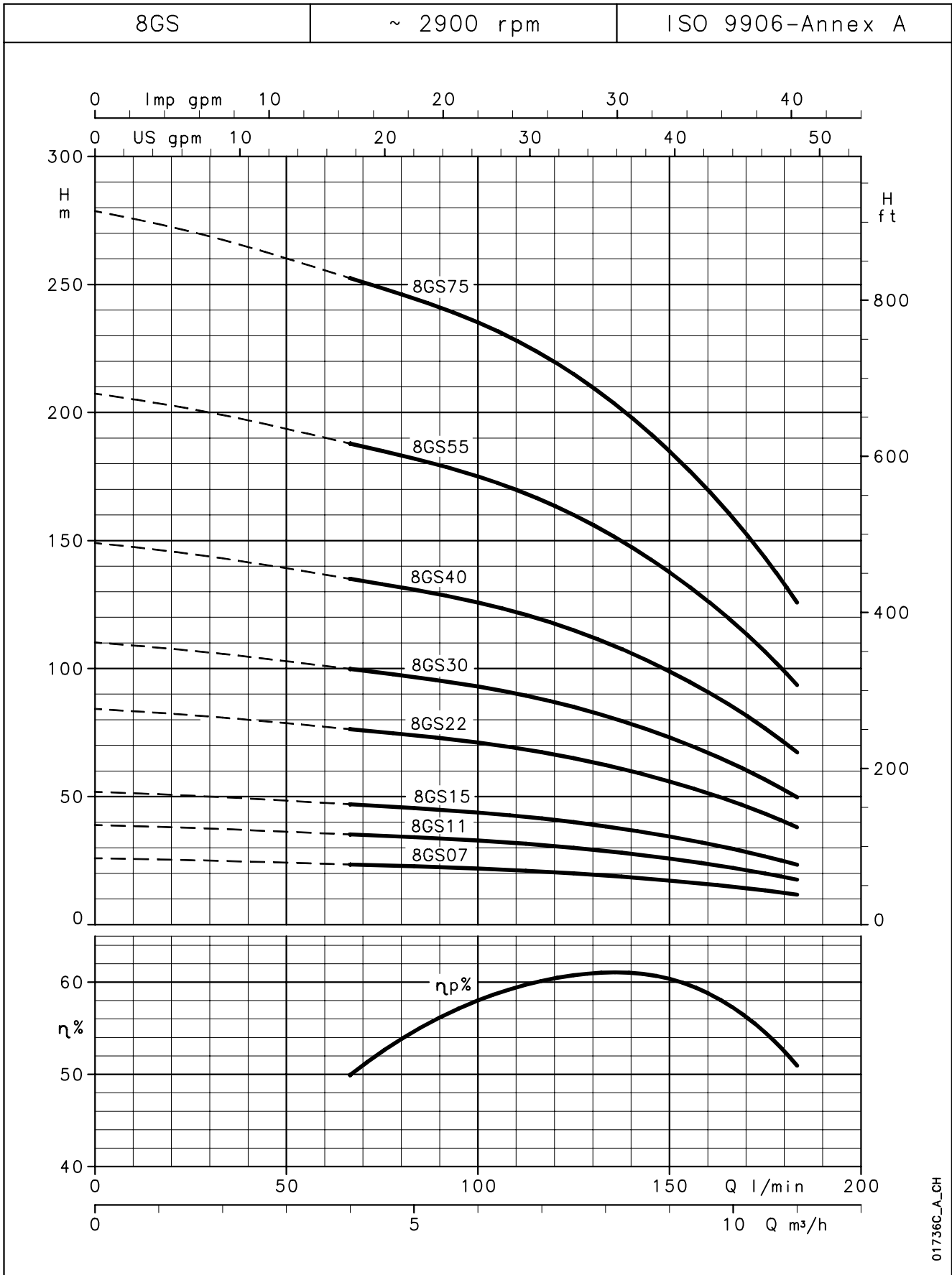
01734_B_DD



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8GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



01736C_A_CH

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



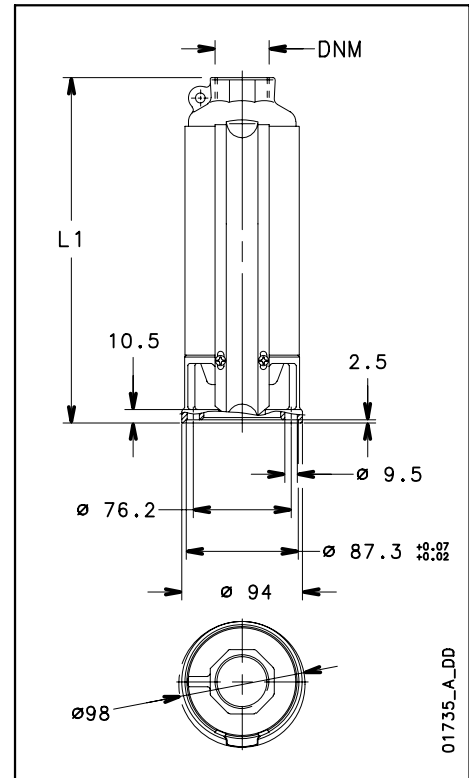
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12GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	100	150	175	200	250
				m ³ /h	0	6	9	10,5	12	15
				H = TOTAL HEAD METRES COLUMN OF WATER						
12GS15	7	1,5	2	43,9	37,3	31	28	24	14,6	
12GS22	11	2,2	3	69	58,4	49	43	37	22,5	
12GS30	15	3	4	94	79,4	67	59	50	30	
12GS40	20	4	5,5	128,6	109,9	94	84	73	46	
12GS55	27	5,5	7,5	173,6	148,3	127	113	98	62	
12GS75	35	7,5	10	221,8	190,2	163	146	126	80	

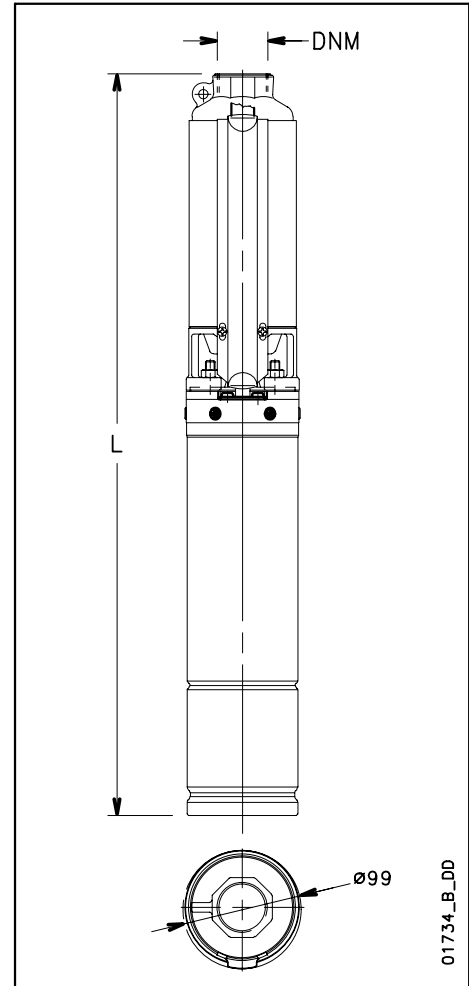
12gs-2p50-en_b_th



12GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
12GS15M-4OS	7	Rp 2	539	987	5,2	18
12GS22M-4OS	11	Rp 2	785	1283	7,9	23
12GS15T-4OS	7	Rp 2	539	952	5,2	16,6
12GS22T-4OS	11	Rp 2	785	1233	7,9	20,8
12GS30T-4OS	15	Rp 2	992	1440	10	23,9
12GS40T-4OS	20	Rp 2	1252	1820	12,6	30,4
12GS55T-4OS	27	Rp 2	1634	2262	16,8	38,1
12GS75T-4OS	35	Rp 2	2049	2883	20,9	49,7

12gs-4os-2p50-en_a_td



12GS..L4C SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
12GS15M-L4C	7	Rp 2	539	930	5,2	17,9
12GS22M-L4C	11	Rp 2	785	1196	7,9	22,1
12GS15T-L4C	7	Rp 2	539	885	5,2	17,2
12GS22T-L4C	11	Rp 2	785	1176	7,9	20,7
12GS30T-L4C	15	Rp 2	992	1534	10	30,6
12GS40T-L4C	20	Rp 2	1252	1864	12,6	36,3
12GS55T-L4C	27	Rp 2	1634	2316	16,8	43,8
12GS75T-L4C	35	Rp 2	2049	2811	20,9	50,1

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

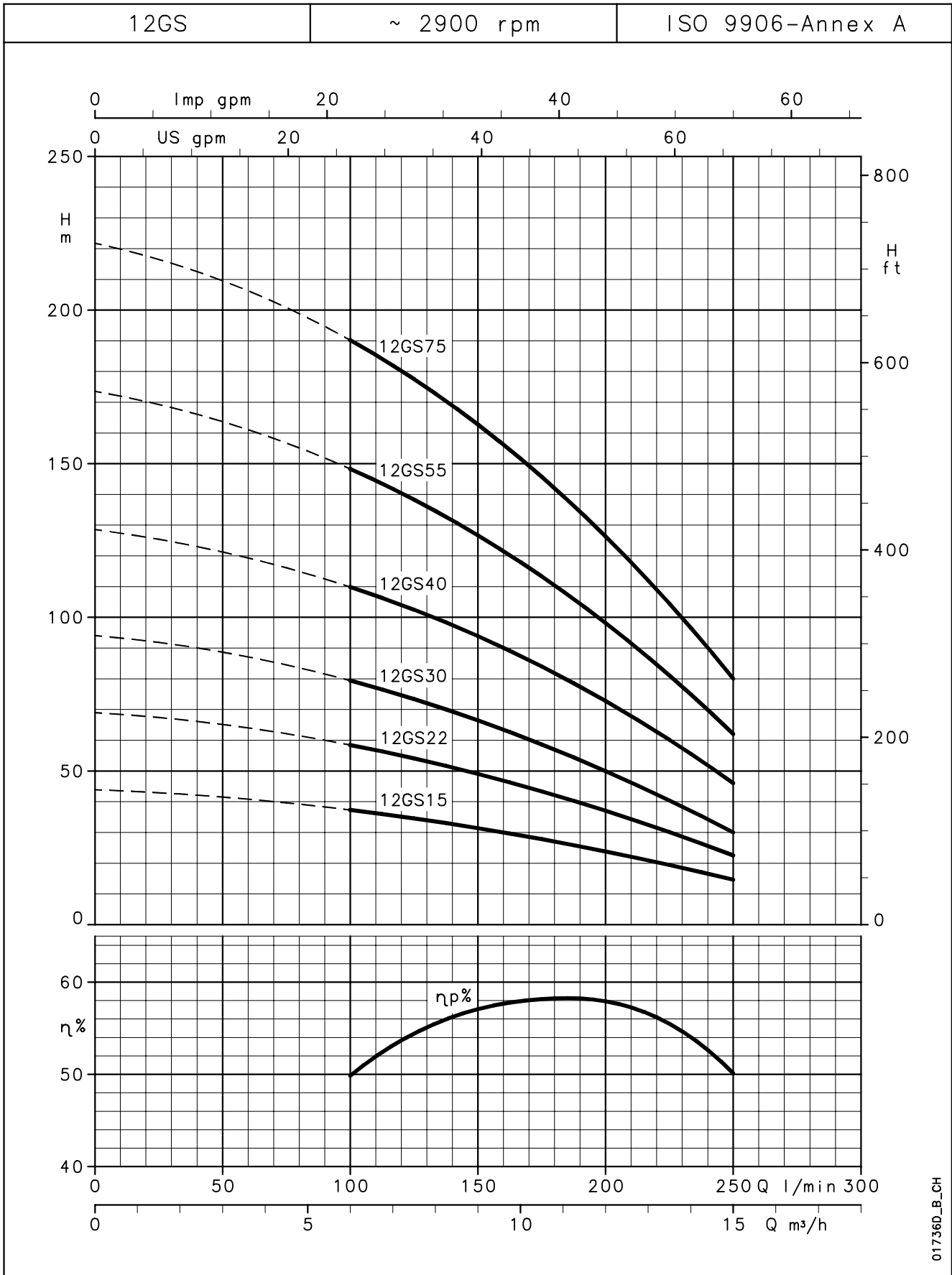
12gs-l4c-2p50-en_a_td



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12GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



017360_B_CH

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



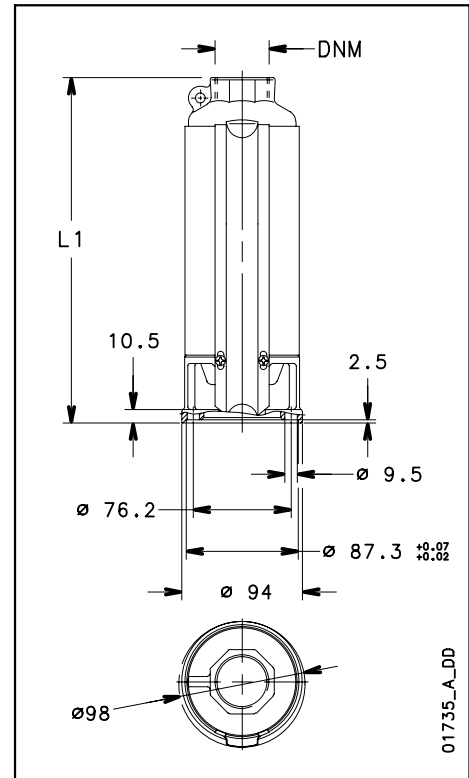
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16GS SERIES OPERATING CHARACTERISTICS AT 50 Hz

PUMP TYPE	N. OF STAGES	MOTOR POWER		Q = DELIVERY						
				l/min	0	133	200	250	300	367
				m ³ /h	0	8	12	15	18	22
				H = TOTAL HEAD METRES COLUMN OF WATER						
16GS22	9	2,2	3	49,5	40,3	34	29	23	14	
16GS30	12	3	4	66	54	46	39	31	20,4	
16GS40	16	4	5,5	92,1	74,9	64	54	44	29	
16GS55	21	5,5	7,5	120,9	98,6	84	72	59	39	
16GS75	28	7,5	10	161,2	131,5	112	96	78	52	

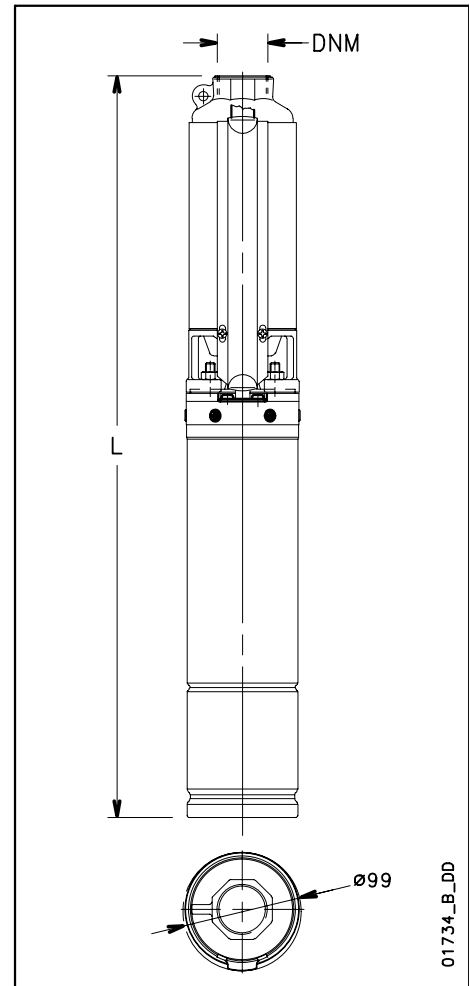
16gs-2p50-en_b_th



16GS..4OS SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
16GS22M-4OS	9	Rp 2	749	1247	7,7	22,8
16GS22T-4OS	9	Rp 2	749	1197	7,7	20,6
16GS30T-4OS	12	Rp 2	953	1401	9,7	23,6
16GS40T-4OS	16	Rp 2	1224	1792	12,4	30,2
16GS55T-4OS	21	Rp 2	1620	2248	16,5	37,8
16GS75T-4OS	28	Rp 2	2096	2930	21,2	50

16gs-4os-2p50-en_a_td



16GS..L4C SERIES DIMENSIONS AND WEIGHTS

ELECTRO PUMP TYPE *	N. OF STAGES	DNM	DIMENSIONS (mm)		PUMP WEIGHT kg	ELECTRO PUMP WEIGHT kg
			L1	L		
16GS22M-L4C	9	Rp 2	749	1160	7,7	21,9
16GS22T-L4C	9	Rp 2	749	1140	7,7	20,5
16GS30T-L4C	12	Rp 2	953	1495	9,7	30,3
16GS40T-L4C	16	Rp 2	1224	1836	12,4	36,1
16GS55T-L4C	21	Rp 2	1620	2302	16,5	43,5
16GS75T-L4C	28	Rp 2	2096	2858	21,2	50,4

* Electric pumps exceeding 1500 mm in length are supplied uncoupled.
Motor and pump are packed separately.

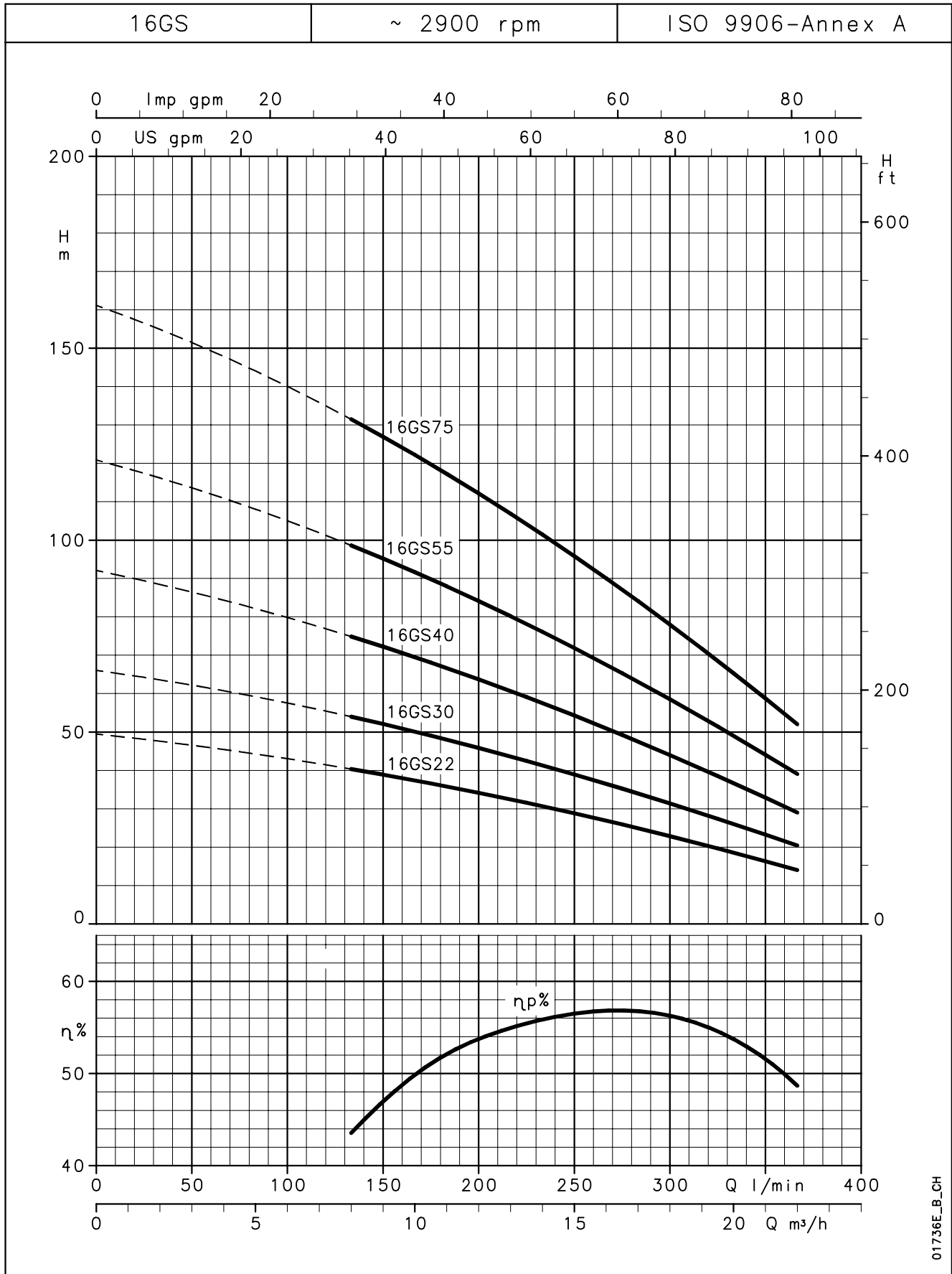
16gs-l4c-2p50-en_a_td



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Lowara

16GS SERIES OPERATING CHARACTERISTICS AT 50 Hz



01736E_B_CH

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

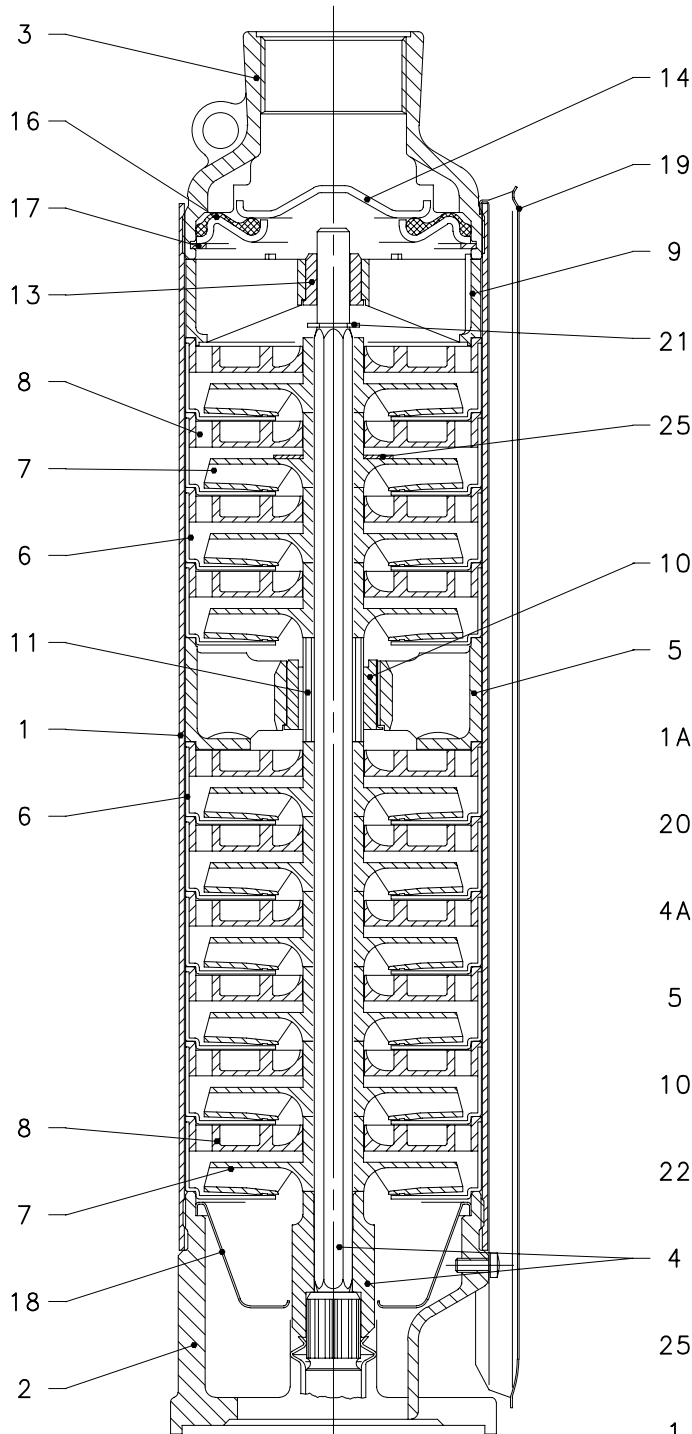


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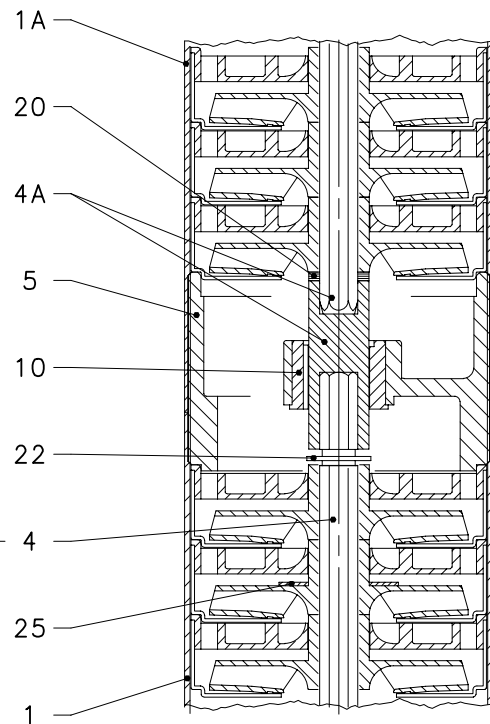
1GSL - 2GS - 4GS SERIES

PUMP SECTION AND LIST OF MAIN COMPONENTS



REF. N.	DESCRIPTION
1	Sleeve
1A	Upper sleeve
2	Lower support
3	Delivery port
4	Shaft with coupling
4A	Upper shaft with coupling
5	Intermediate support
6	Wear box
7	Impeller
8	Diffuser
9	Upper support
10	Intermediate bush bearing
11	Shaft sleeve
13	Upper bush bearing
14	Valve cup
16	Valve support with gasket
17	Valve lock ring
18	Filter
19	Cable guard
20	Impeller shim
21	Upper split ring
22	Intermediate split ring
25	Washer

1gsl-2gs-4gs-2p50-en_a_tp

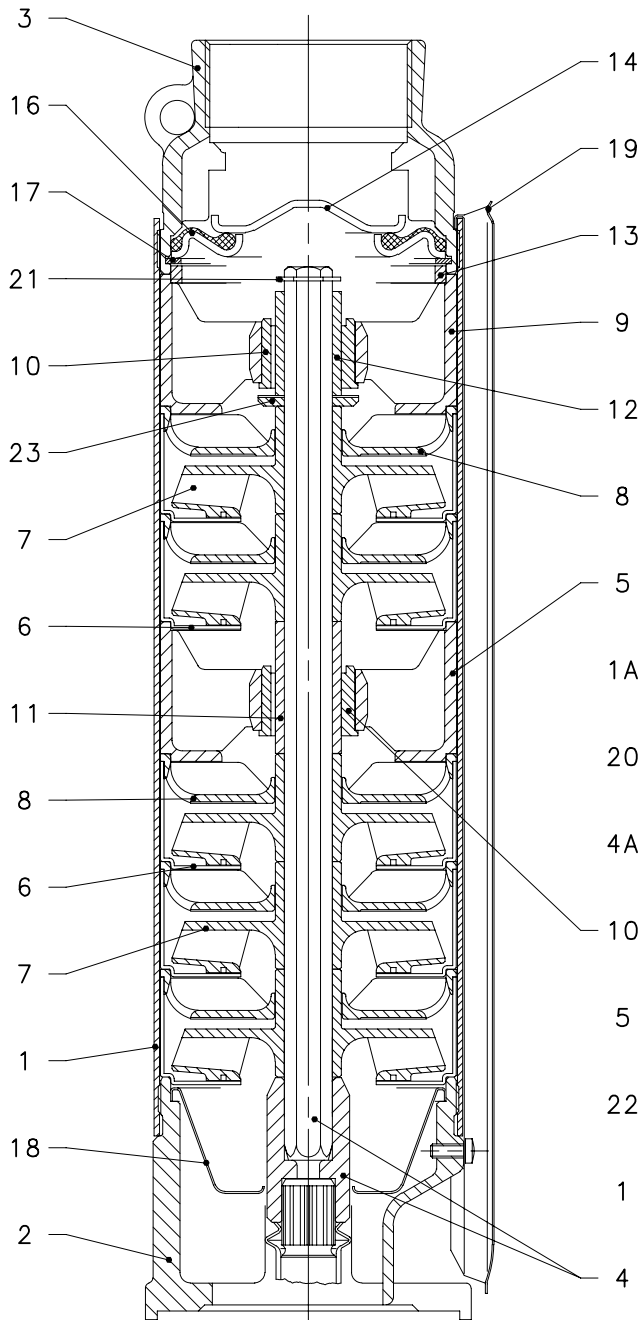


01731A_B_DS



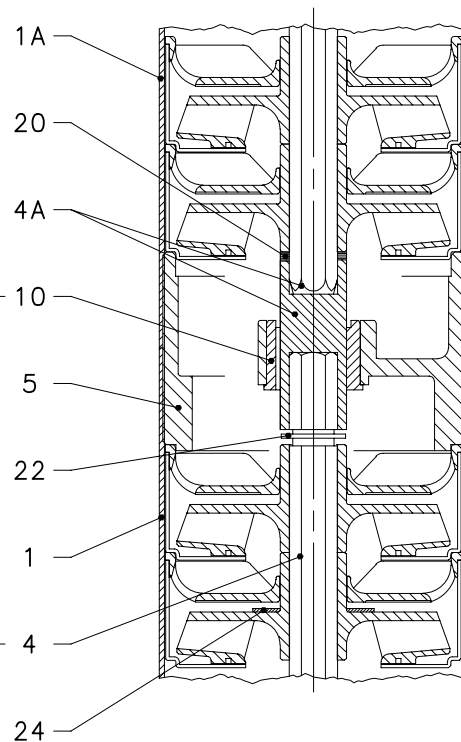
6GS - 8GS SERIES

PUMP SECTION AND LIST OF MAIN COMPONENTS



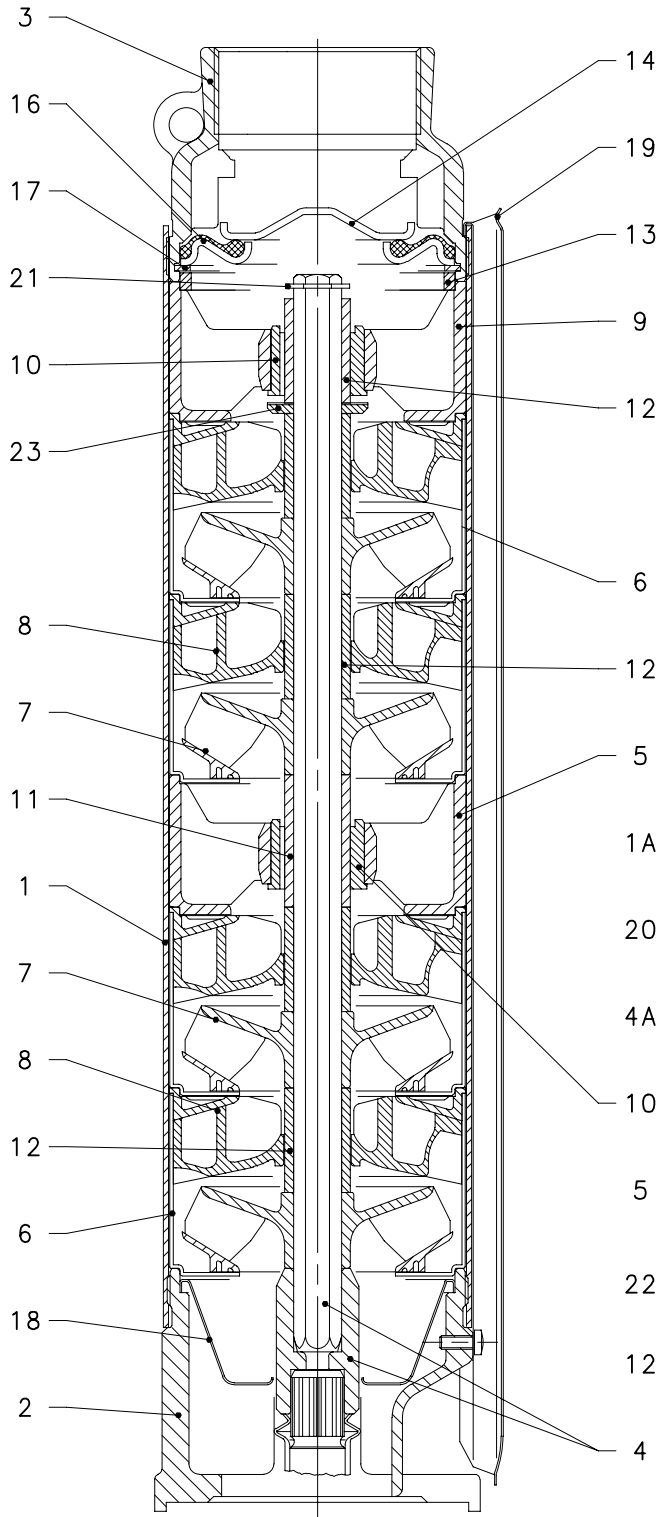
REF. N.	DESCRIPTION
1	Sleeve
1A	Upper sleeve
2	Lower support
3	Delivery port
4	Shaft with coupling
4A	Upper shaft with coupling
5	Intermediate support
6	Wear box
7	Impeller
8	Diffuser
9	Upper support
10	Bush bearing
11	Shaft sleeve
12	Upper spacer
13	Adapter ring
14	Valve cap
16	Valve support with gasket
17	Valve lock ring
18	Filter
19	Cable guard
20	Impeller shim
21	Upper split ring
22	Intermediate split ring
23	Thrust washer
24	Washer

6gs-8gs-2p50-en_a_tp



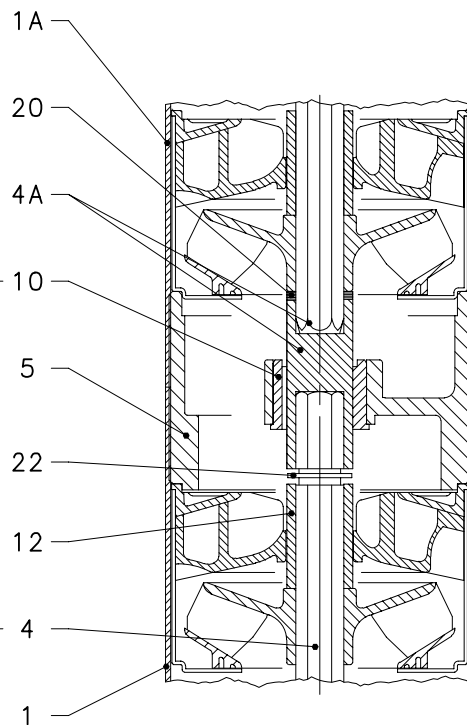


12GS SERIES PUMP SECTION AND LIST OF MAIN COMPONENTS



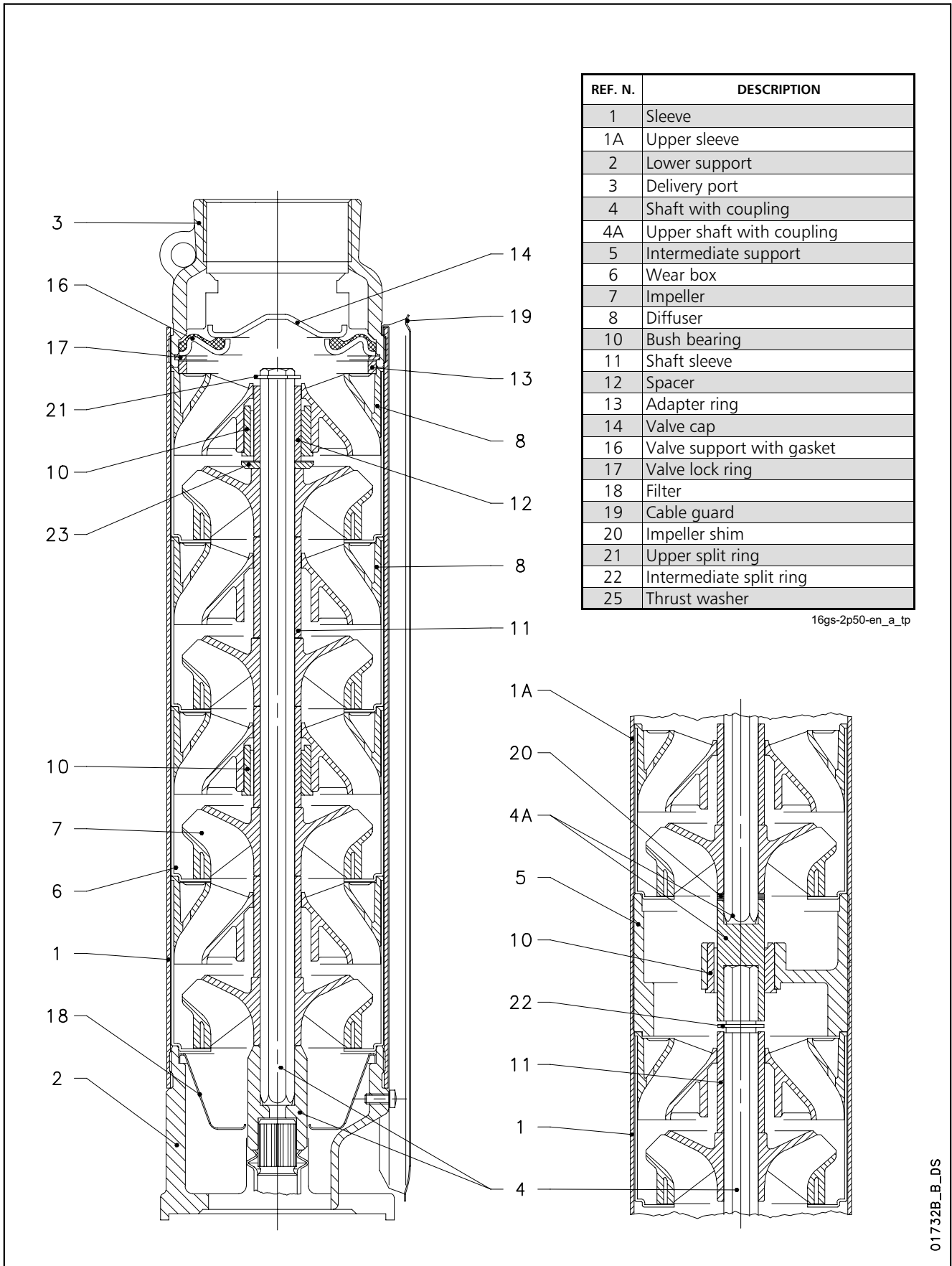
REF. N.	DESCRIPTION
1	Sleeve
1A	Upper sleeve
2	Lower support
3	Delivery port
4	Shaft with coupling
4A	Upper shaft with coupling
5	Intermediate support
6	Wear box
7	Impeller
8	Diffuser
9	Upper support
10	Bush bearing
11	Shaft sleeve
12	Spacer
13	Adapter ring
14	Valve cap
16	Valve support with gasket
17	Valve lock ring
18	Filter
19	Cable guard
20	Impeller shim
21	Upper split ring
22	Intermediate split ring
25	Thrust washer

12gs-2p50-en_a_tp





16GS SERIES PUMP SECTION AND LIST OF MAIN COMPONENTS



01732B_B_DS



Lowara

4" Submersible motors

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

4OS Series



SPECIFICATIONS

- **Stainless steel** outer sleeve.
- Shaft extension and coupling dimensions to **NEMA** standards.
- **Rewindable stator.**
- Class **F insulation.**
- Protection class: **IP68.**
- **Internal fluid** according to standards for oils in contact with foodstuffs (F.D.A. - FOOD AND DRUG ADMINISTRATION).
- Compensating bellows for internal liquid expansion.
- Axial load supported by angular bearings.
- **Mechanical seal** protected by sand guard.
- Maximum **immersion depth:** 150 m.
- Maximum **number of starts per hour** at regular intervals: 30 for direct start; 20 for impedance start.
- Maximum supply **voltage variations** allowed : 230V \pm 10%, 400V \pm 10%.
- Maximum water **temperature** : 35°C. Max. temperature applies to motors working in a installation capable of delivering a flow of water around the motor jacket of at least 0,08 m/s.
- Water **pH:** 4÷8.
- **Axial thrust:** 3000 N from 0,37 to 2,2 kW; 6500 N from 3 to 7,5 kW.
- **Extractable supply cable** fitted with watertight connector.
- **Versions:**
 - Single-phase: 0,37 to 4 kW 220-240 V, 50 Hz
 - Three-phase: 0,37 to 7,5 kW 220-240 V, 50 Hz; 0,37 to 7,5 kW 380-415 V, 50 Hz.
- Horizontal operation up to 2,2 kW.
- Inverter applications.

OPTIONAL FEATURES

- Special voltages.

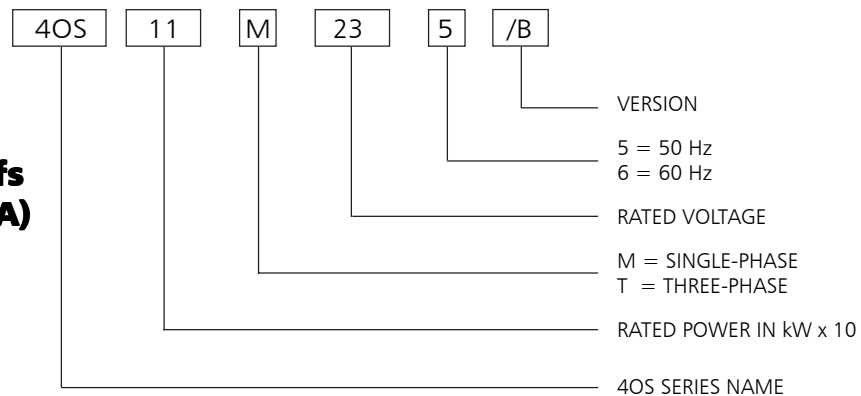
IDENTIFICATION CODE

Rewindable stator

Liquid suitable for use with foodstuffs (complies with FDA)

High starting torque

Power supply cable with extractable connector



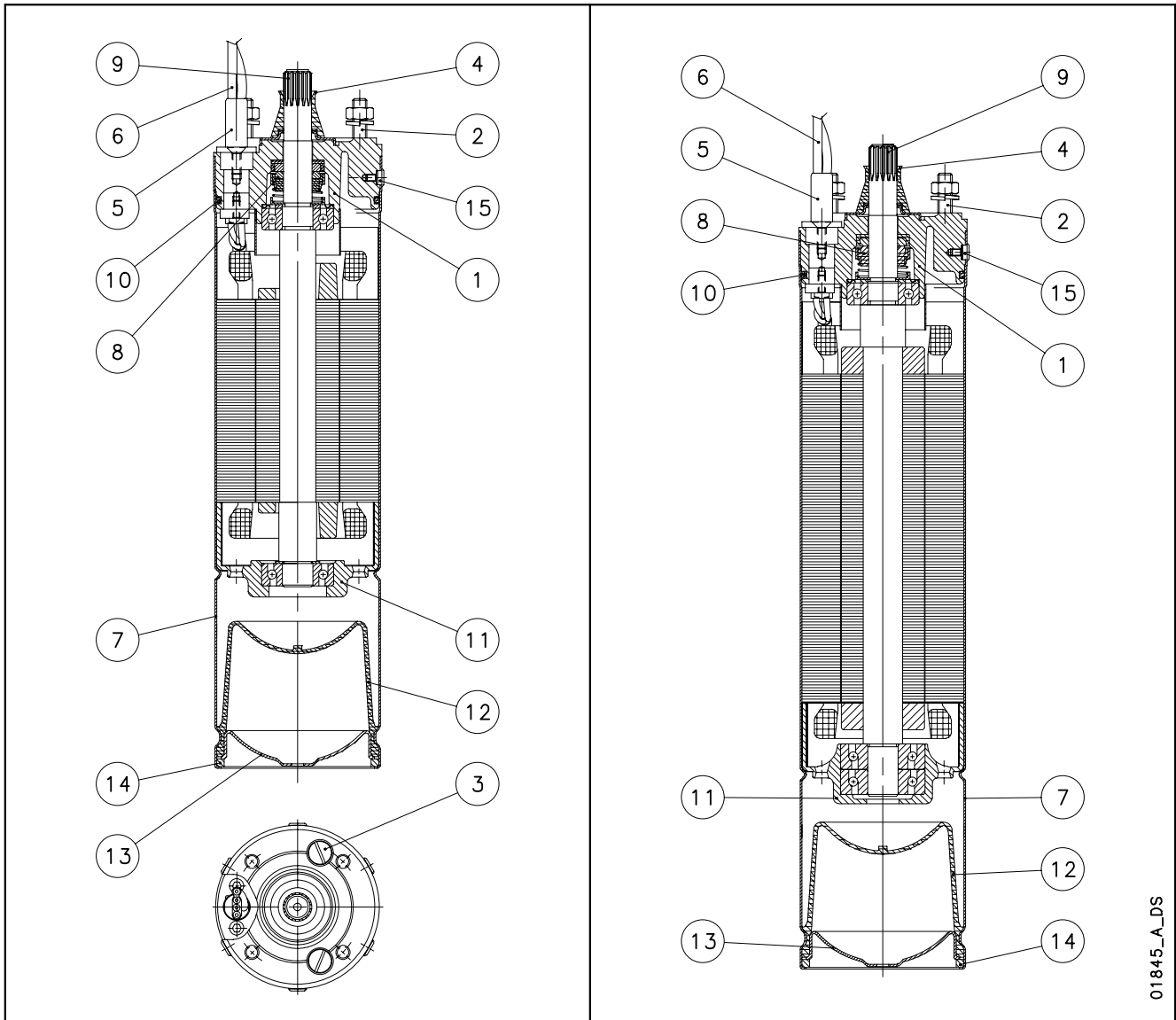
EXAMPLE : 4OS11M235/B

4OS MOTOR :
RATED POWER 1,1 kW; SINGLE-PHASE;
RATED VOLTAGE 230 V; 50 Hz; /B VERSION.



40S SERIES MOTORS

MOTOR CROSS SECTION AND TABLE OF MATERIALS



01845_A_DS

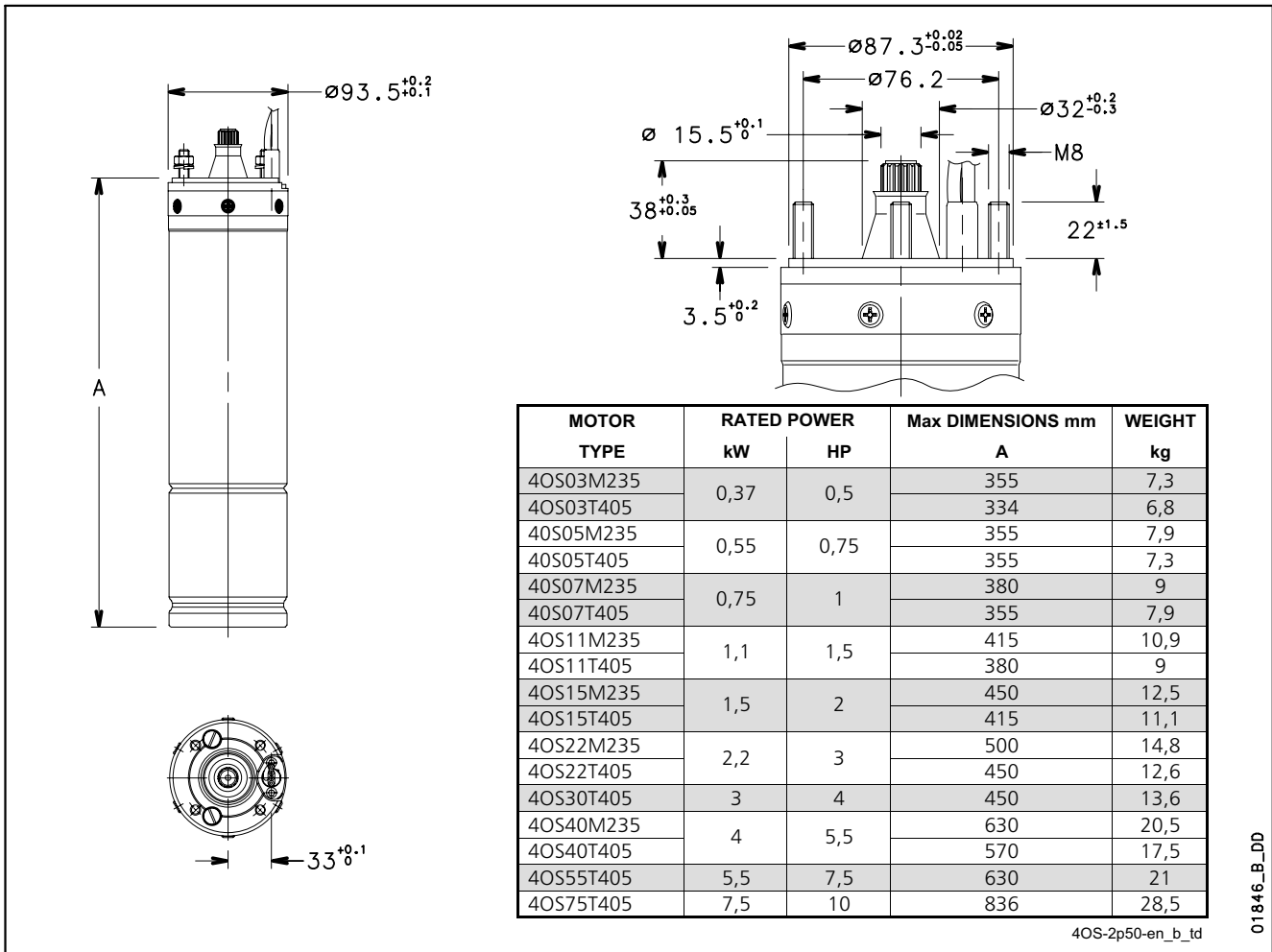
REF. N.	PART	MATERIAL	DESIGNATION	
			EUROPE	USA
1	Head	Brass	EN12165-CuZn40Pb2 (CW617N)	
2	Studs	Stainless steel	EN 10088-3-X5CrNi18-10 (1.4301)	AISI 304
3	Filling screws	Brass	EN12165-CuZn40Pb2 (CW617N)	
4	Sand guard	NBR		
5	Connector sleeve	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
6	Cable	Epdm		
7	Outer sleeve	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
8	Mechanical seal	Graphite / Aluminium oxide		
9	Shaft end for $P \leq 2.2$ kW	Stainless steel	EN 10088-3-X8CrNiS18-9 (1.4305)	AISI 303
	Shaft end for $3 \leq P \leq 7.5$ kW	Stainless steel	EN 10088-1-X2CrNiMoN22-5-3 (1.4462)	UNS S 31803
10	Elastomers	NBR		
11	Lower bracket	Cast iron	EN1561-GJL-200 (JL1030)	ASTM Class 25
12	Compensating diaphragm	NBR		
13	Lower protection	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
14	Snap ring	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
15	Screws, nuts, washers	Stainless steel	EN 10088-3-X5CrNi18-10 (1.4301)	AISI 304
	Cooling liquid	Olio atossico		



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4OS SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz



4OS-2p50-en_b_td

01846_B_DD

SINGLE-PHASE OPERATING CHARACTERISTICS AT 50 Hz

MOTOR TYPE	RATED POWER		RATED VOLTAGE	CAPACITOR	OPERATING CHARACTERISTICS AT RATED POWER				DIRECT START		MAX WATER TEMPERATURE	CABLE TYPE			
	kW	HP			V	μF/450V	RATED CURRENT		cosφ	Ts/Tn*		Is/In	°C	Nc x sec	L
							A	rpm							
4OS03M235	0,37	0,5	220	16	3,0	2835	56,8	0,98	0,56	3,08	35	4x1.5	1,75		
			230		3,1	2845	54,7	0,96	0,62	3,17					
			240		3,2	2860	52,5	0,93	0,68	3,2					
4OS05M235	0,55	0,75	220	20	4,1	2815	62,4	0,98	0,60	2,93	35	4x1.5	1,75		
			230		4,1	2830	60,4	0,96	0,66	3,02					
			240		4,3	2845	58,4	0,92	0,72	3,06					
4OS07M235	0,75	1	220	30	5,4	2825	63,3	0,99	0,57	3,07	35	4x1.5	1,75		
			230		5,5	2840	61,6	0,97	0,63	3,2					
			240		5,6	2855	59,9	0,94	0,69	3,27					
4OS11M235	1,1	1,5	220	40	7,5	2820	67,6	0,99	0,62	2,97	35	4x1.5	1,75		
			230		7,4	2840	66,3	0,98	0,68	3,14					
			240		7,6	2850	63,9	0,95	0,74	3,2					
4OS15M235	1,5	2	220	50	10,0	2830	69,3	0,98	0,48	3,1	35	4x1.5	1,75		
			230		10,1	2845	67,6	0,96	0,53	3,22					
			240		10,5	2855	64,9	0,92	0,58	3,22					
4OS22M235	2,2	3	220	70	14,3	2805	71,1	0,99	0,46	2,71	35	4x1.5	2,5		
			230		14,1	2820	69,6	0,97	0,50	2,86					
			240		14,4	2840	67,7	0,94	0,55	2,93					
4OS40M235	4	5,5	220	90	25,7	2850	73,8	0,96	0,42	3,48	35	4 x 2	2,5		
			230		24,9	2870	74,0	0,94	0,46	3,76					
			240		24,8	2880	73,4	0,92	0,50	3,94					

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

**40S 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	
				RATED CURRENT	rpm	η %	cos ϕ	Ts/Tn*	Is/In		°C	Nc x sec
	THREE-PHASE	kW	HP							V		
40S03T235	0,37	0,5	220	2,0	2835	62	0,78	3,4	5,1	35	4x1,5	1,75
			230	2,1	2855	62	0,72	3,8	5,3			
			240	2,2	2865	61	0,68	4,1	5,3			
40S05T235	0,55	0,75	220	2,8	2795	65	0,8	2,8	4,6	35	4x1,5	1,75
			230	2,9	2820	64	0,75	3,1	4,7			
			240	3,0	2835	63	0,71	3,4	4,7			
40S07T235	0,75	1	220	3,8	2790	68	0,78	3,3	4,6	35	4x1,5	1,75
			230	4,0	2815	67	0,71	3,6	4,7			
			240	4,2	2825	65	0,67	3,9	4,6			
40S11T235	1,1	1,5	220	5,1	2780	72	0,8	2,7	4,2	35	4x1,5	1,75
			230	5,2	2810	71	0,74	3,0	4,4			
			240	5,4	2820	70	0,7	3,2	4,3			
40S15T235	1,5	2	220	7,0	2790	73	0,78	3,0	4,7	35	4x1,5	1,75
			230	7,2	2815	72	0,72	3,4	4,8			
			240	7,6	2825	70	0,68	3,7	4,7			
40S22T235	2,2	3	220	9,7	2785	74	0,80	2,3	4,7	35	4x1,5	2,5
			230	10,0	2810	74	0,74	2,6	4,8			
			240	10,5	2825	73	0,69	2,7	4,7			
40S30T235	3	4	220	12,1	2810	77	0,85	1,8	4,2	35	4x1,5	2,5
			230	12,0	2830	77	0,81	2,0	4,5			
			240	12,3	2845	77	0,77	2,2	4,6			
40S40T235	4	5,5	220	16,4	2810	75	0,85	2,2	4,8	35	4x1,5	2,5
			230	16,5	2840	76	0,80	2,4	5,0			
			240	17,0	2850	75	0,76	2,6	5,0			
40S55T235	5,5	7,5	220	22,9	2795	76	0,83	1,8	4,6	35	4x1,5	2,5
			230	23,0	2820	77	0,78	2,0	4,8			
			240	23,7	2840	77	0,73	2,2	4,9			
40S75T235	7,5	10	220	31,0	2820	78	0,82	1,9	4,9	35	4x1,5	4
			230	31,4	2850	79	0,76	2,1	5,1			
			240	32,4	2860	78	0,71	2,3	5,1			
40S03T405	0,37	0,5	380	1,2	2835	62	0,78	3,4	5,1	35	4x1,5	1,75
			400	1,2	2855	62	0,72	3,8	5,3			
			415	1,2	2865	61	0,68	4,1	5,3			
40S05T405	0,55	0,75	380	1,6	2795	65	0,8	2,8	4,6	35	4x1,5	1,75
			400	1,7	2820	64	0,75	3,1	4,7			
			415	1,7	2835	63	0,71	3,4	4,7			
40S07T405	0,75	1	380	2,2	2790	68	0,78	3,3	4,6	35	4x1,5	1,75
			400	2,3	2815	67	0,71	3,6	4,7			
			415	2,4	2825	65	0,67	3,9	4,6			
40S11T405	1,1	1,5	380	2,9	2780	72	0,8	2,7	4,2	35	4x1,5	1,75
			400	3,0	2810	71	0,74	3,0	4,4			
			415	3,1	2820	70	0,7	3,2	4,3			
40S15T405	1,5	2	380	4,0	2790	73	0,78	3,0	4,7	35	4x1,5	1,75
			400	4,2	2815	72	0,72	3,4	4,8			
			415	4,4	2825	70	0,68	3,7	4,7			
40S22T405	2,2	3	380	5,6	2785	74	0,80	2,3	4,7	35	4x1,5	2,5
			400	5,8	2810	74	0,74	2,6	4,8			
			415	6,1	2825	73	0,69	2,7	4,7			
40S30T405	3	4	380	7,0	2810	77	0,85	1,8	4,2	35	4x1,5	2,5
			400	7,0	2830	77	0,81	2,0	4,5			
			415	7,1	2845	77	0,77	2,2	4,6			
40S40T405	4	5,5	380	9,5	2810	75	0,85	2,2	4,8	35	4x1,5	2,5
			400	9,5	2840	76	0,80	2,4	5,0			
			415	9,8	2850	75	0,76	2,6	5,0			
40S55T405	5,5	7,5	380	13,2	2795	76	0,83	1,8	4,6	35	4x1,5	2,5
			400	13,3	2820	77	0,78	2,0	4,8			
			415	13,7	2840	77	0,73	2,2	4,9			
40S75T405	7,5	10	380	17,9	2820	78	0,82	1,9	4,9	35	4x1,5	4
			400	18,1	2850	79	0,76	2,1	5,1			
			415	18,7	2860	78	0,71	2,3	5,1			

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

4" Submersible motors

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

L4C Series



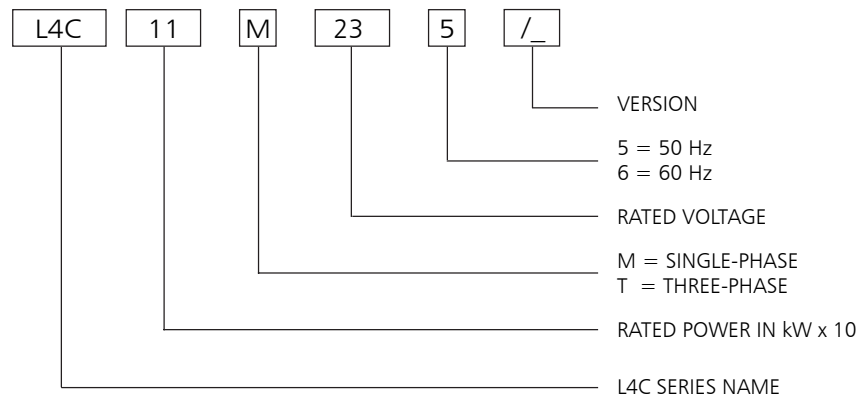
SPECIFICATIONS

- **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.
 - **Lip seal** protected by sand guard.
 - Maximum **immersion depth**: 300 m.
 - Maximum **number of starts per hour** at regular intervals: 40 for direct start; 20 for impedance start.
 - Maximum supply **voltage variations** allowed : $\pm 6\%$.
 - Maximum water **temperature**: 35°C.
- Max. temperature applies to motors working in a installation capable of delivering a flow of water around the motor jacket of at least 0,3 m/s.
- **Axial thrust**:
2000 N from 0,37 to 1,1 kW;
3000 N from 1,5 to 2,2 kW;
6000 N from 3 to 7,5 kW.
 - **Extractable supply cable** fitted with watertight connector.
 - **Versions**:
- Single-phase:
0,37 to 4 kW 220-240 V, 50 Hz (0,37 to 1,1 kW with built in automatic reset overload protection).
- Three-phase:
0,37 to 5,5 kW 220-240 V, 50 Hz
0,37 to 7,5 kW 380-415 V, 50 Hz.
 - Can also operate in horizontal position, provided that the associated pump can apply an axial thrust of at least 100 N on the entire operating field.

OPTIONAL FEATURES

- Special voltages.
- Inverter applications.

IDENTIFICATION CODE



EXAMPLE : L4C11M235

L4C MOTOR :
RATED POWER 1,1 kW; SINGLE-PHASE;
RATED VOLTAGE 230 V; 50 Hz

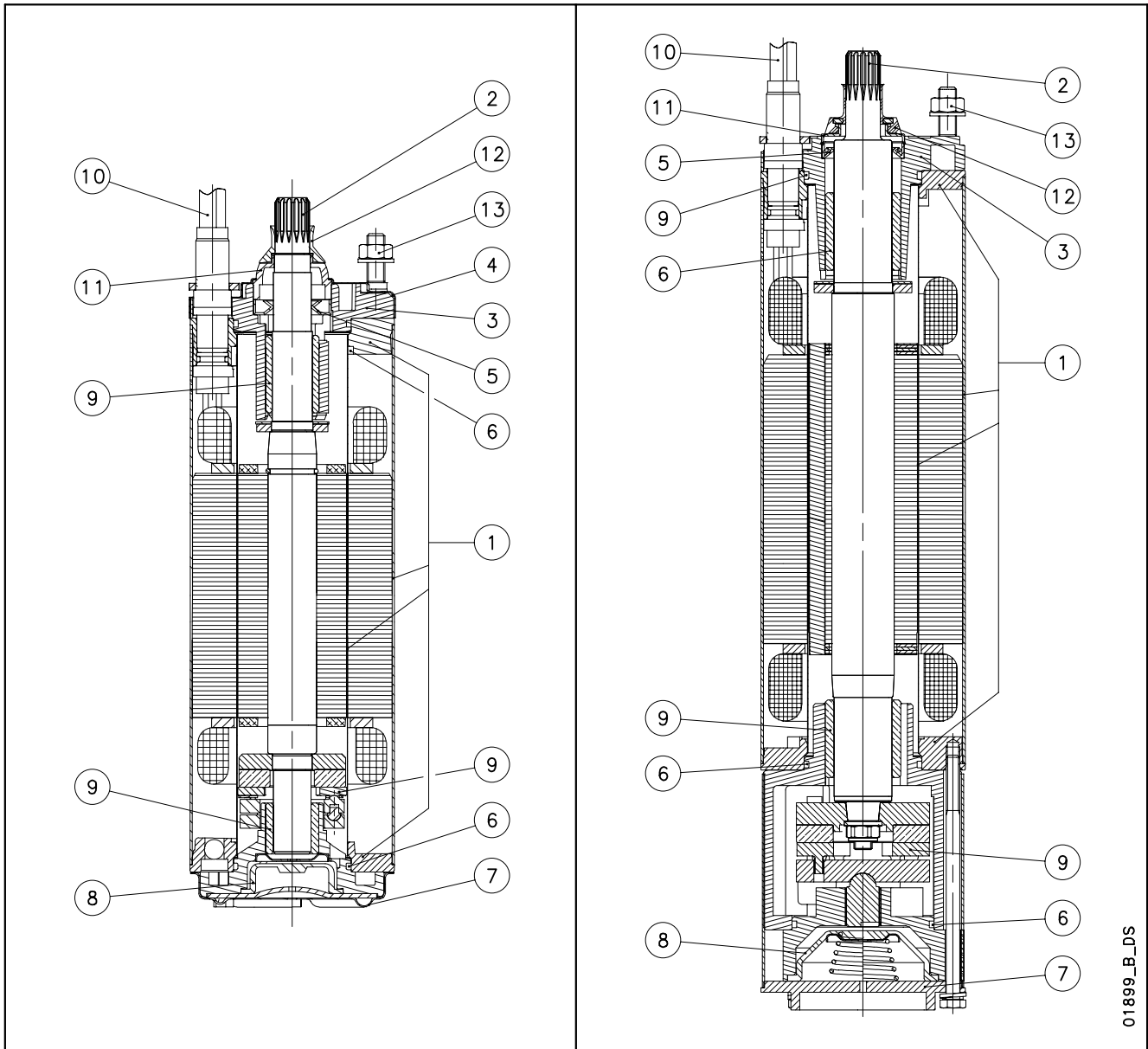
High starting torque

Power supply cable with extractable connector



L4C SERIES MOTORS

MOTOR CROSS SECTION AND TABLE OF MATERIALS



01899_B_DS

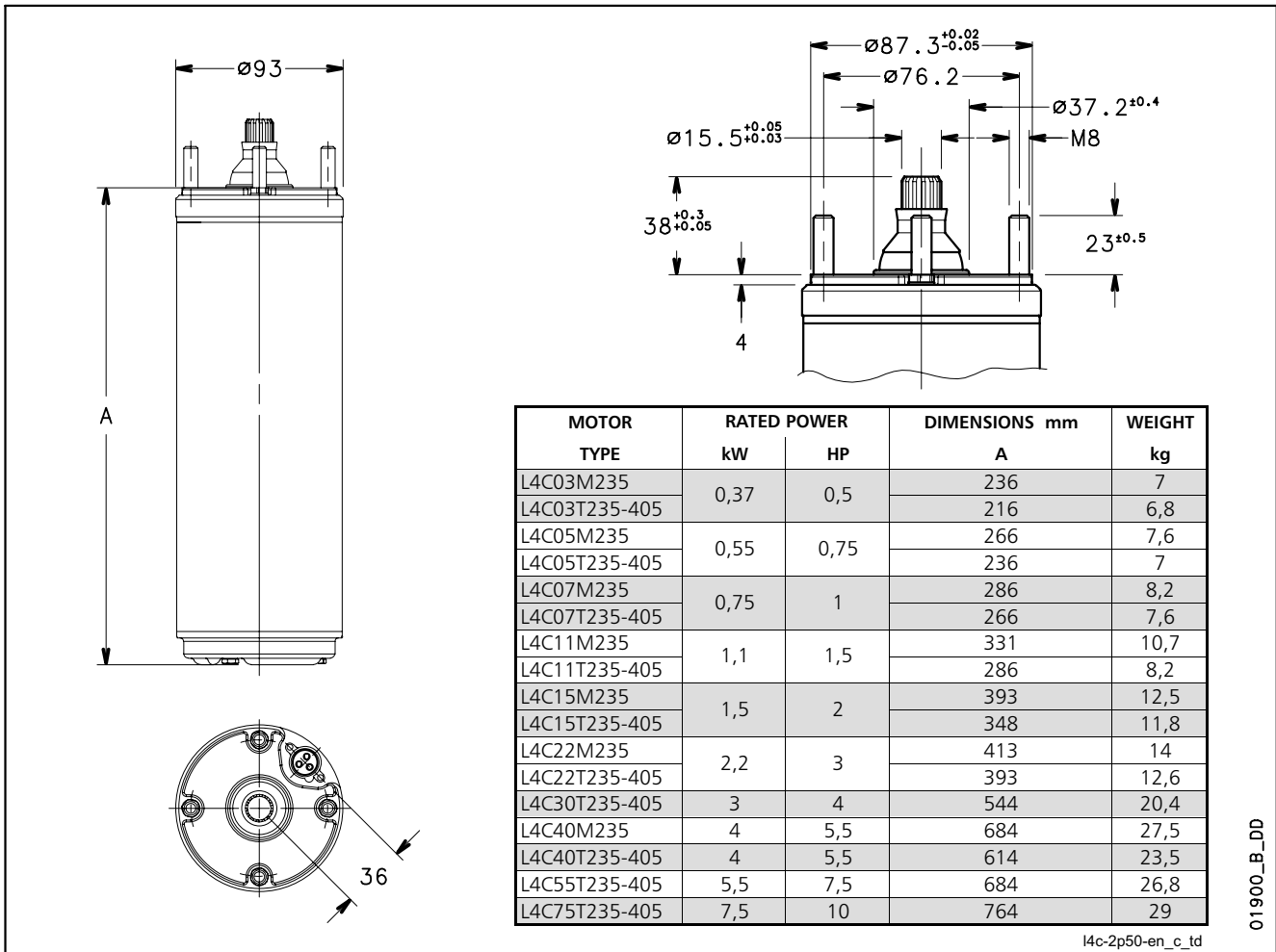
REF N°	PART	MATERIAL	DESIGNATION	
			EUROPE	USA
1	Inner and outer sleeve	Stainless steel	EN 10088-1-X2CrNi18-9 (1.4307)	AISI304L
	Flange	Carbon steel	EN 10025 - S355JR (Fe 510-B)	ASTM A105
2	Shaft extension (up to 2.2 kW)	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
	Shaft extension (from 3 kW)	Stainless steel	EN 10088-1-X2CrNiN23-4 (1.4362)	ASTM 32304
3	Upper bracket	Cast iron	EN-GJL-200	Class 25 B
4	Upper cover	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
5	Lip seal	NBR		
6	Elastomers	NBR		
7	Lower cover	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
8	Compensating bellows	EPDM		
9	Bearings	Carbon-graphite		
10	Cable	EPDM		
11	Fixed sand guard	Nylon		
12	Removable sand guard	NBR		
13	Bolts and screws	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI304
	Cooling liquid	Deminerlized water + antifreeze		



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L4C SERIES MOTORS DIMENSIONS AND WEIGHTS AT 50 Hz



I4c-2p50-en_c_td

01900_B_DD

SINGLE-PHASE OPERATING CHARACTERISTICS AT 50 Hz

MOTOR TYPE	RATED POWER		RATED VOLTAGE V	CAPACITOR μ F/450V	OPERATING CHARACTERISTICS AT RATED POWER				DIRECT START		MAX WATER TEMPERATURE $^{\circ}$ C	CABLE TYPE	
	kW	HP			RATED CURRENT A	rpm	η %	cos ϕ	Ts/Tn*	Is/In		Ncxsec.(mm 2)	L (m)
L4C03M235	0,37	0,5	220	16	3,2	2810	53	0,96	0,63	2,68	35	4x1,5	1,7
			230		3,3	2820	54	0,97	0,69	2,72			
			240		3,4	2830	50	0,91	0,75	2,76			
L4C05M235	0,55	0,75	220	20	4,3	2810	61	0,95	0,62	3,3	35	4x1,5	1,7
			230		4,6	2820	56	0,94	0,68	3,2			
			240		4,8	2830	54	0,90	0,74	3,26			
L4C07M235	0,75	1	220	30	6	2810	60	0,93	0,63	3,18	35	4x1,5	1,7
			230		6,2	2820	58	0,92	0,66	3,2			
			240		6,5	2830	56	0,85	0,75	3,2			
L4C11M235	1,1	1,5	220	40	8,1	2800	67	0,94	0,60	3,48	35	4x1,5	1,7
			230		8,1	2835	65	0,92	0,60	3,54			
			240		8,3	2850	63	0,87	0,62	3,62			
L4C15M235	1,5	2	220	50	10,4	2800	67	0,96	0,74	3,3	35	4x1,5	1,7
			230		10,4	2820	66	0,93	0,74	3,38			
			240		10,7	2835	64	0,90	0,76	3,46			
L4C22M235	2,2	3	220	70	15,4	2740	68	0,96	0,54	3,1	35	4x1,5	1,7
			230		15	2770	68	0,94	0,54	3,2			
			240		15,3	2790	66	0,91	0,54	3,3			
L4C40M235	4	5,5	220	90	24,5	2840	70	0,94	0,46	3,5	35	4x2	2,7
			230		25	2850	68	0,95	0,51	3,6			
			240		27,4	2860	65	0,84	0,60	3,4			

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

**L4C 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 °C	CABLE TYPE	
	kW	HP		A	rpm	η %	cos ϕ	Ts/Tn*	Is/In		Nc x sec mm ²	L m
L4C03T235	0,37	0,5	220	2,6	2810	51	0,69	2,7	3,7	35	4x1.5	1,7
			230	2,7	2820	53	0,7	3	3,7			
			240	3,1	2830	48	0,67	3,2	3,4			
L4C05T235	0,55	0,75	220	3,1	2820	61	0,77	2,8	4,3	35	4x1.5	1,7
			230	3,3	2830	60	0,71	3,1	4,2			
			240	3,5	2840	60	0,66	3,3	4,2			
L4C07T235	0,75	1	220	4	2820	65	0,77	2,9	5	35	4x1.5	1,7
			230	4,1	2830	63	0,73	3,2	5,1			
			240	4,5	2840	63	0,66	3,5	4,8			
L4C11T235	1,1	1,5	220	5,6	2820	62	0,8	3	4	35	4x1.5	1,7
			230	5,7	2830	64	0,76	3,3	4,2			
			240	6,2	2840	63	0,73	3,6	4			
L4C15T235	1,5	2	220	7,4	2820	68	0,77	3,1	4,2	35	4x1.5	1,7
			230	7,6	2830	68	0,72	3,4	4,3			
			240	8	2840	67	0,68	3,7	4,3			
L4C22T235	2,2	3	220	10	2810	72	0,8	3	4,3	35	4x1.5	1,7
			230	10,2	2820	71	0,78	3,2	4,4			
			240	10,7	2830	70	0,7	3,5	4,4			
L4C30T235	3	4	220	13,7	2830	75	0,77	3	4,6	35	4x1.5	2,7
			230	14,3	2840	74	0,71	3,3	4,6			
			240	15,2	2850	70	0,68	3,5	4,5			
L4C40T235	4	5,5	220	16,4	2840	76	0,81	3,10	5,6	35	4x2	2,7
			230	17,3	2850	75	0,79	3,40	5,6			
			240	18,2	2860	72	0,74	3,70	5,5			
L4C55T235	5,5	7,5	220	23,4	2840	78	0,79	3	5,4	35	4x2	2,7
			230	24,2	2850	77	0,74	3,4	5,5			
			240	25	2860	76	0,7	3,6	5,5			
L4C03T405	0,37	0,5	380	1,5	2810	51	0,69	2,7	3,8	35	4x1.5	1,7
			400	1,6	2820	53	0,7	3	3,8			
			415	1,8	2830	48	0,67	3,2	3,4			
L4C05T405	0,55	0,75	380	1,8	2820	61	0,77	2,8	4,2	35	4x1.5	1,7
			400	1,9	2830	60	0,71	3,1	4,2			
			415	2	2840	60	0,66	3,3	4,1			
L4C07T405	0,75	1	380	2,3	2820	65	0,77	2,9	5	35	4x1.5	1,7
			400	2,4	2830	63	0,73	3,2	5			
			415	2,6	2840	63	0,66	3,5	4,8			
L4C11T405	1,1	1,5	380	3,3	2820	62	0,8	3	4	35	4x1.5	1,7
			400	3,4	2830	64	0,76	3,3	4,1			
			415	3,6	2840	63	0,73	3,6	4			
L4C15T405	1,5	2	380	4,3	2820	68	0,77	3,1	4,2	35	4x1.5	1,7
			400	4,4	2830	68	0,72	3,4	4,3			
			415	4,6	2840	67	0,68	3,7	4,3			
L4C22T405	2,2	3	380	5,8	2810	72	0,8	3	4,1	35	4x1.5	1,7
			400	5,9	2820	71	0,78	3,2	4,4			
			415	6,2	2830	70	0,7	3,5	4,3			
L4C30T405	3	4	380	7,9	2830	75	0,77	3	4,5	35	4x1.5	2,7
			400	8,3	2840	74	0,71	3,3	4,6			
			415	8,8	2850	70	0,68	3,5	4,5			
L4C40T405	4	5,5	380	9,5	2840	76	0,81	3,1	5,6	35	4x1.5	2,7
			400	10	2850	75	0,79	3,4	5,6			
			415	10,5	2860	72	0,74	3,7	5,5			
L4C55T405	5,5	7,5	380	13,5	2840	78	0,79	3	5,4	35	4x1.5	2,7
			400	14	2850	77	0,74	3,4	5,5			
			415	14,5	2860	76	0,7	3,6	5,5			
L4C75T405	7,5	10	380	17	2840	80	0,84	2,6	4,7	35	4x2	3,5
			400	17,4	2850	79	0,79	2,9	4,8			
			415	18,1	2860	76	0,75	3,1	4,8			

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



ACCESSORIES

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SCUBA SERIES PUMP - PANEL COMBINATION TABLE

PUMP TYPE THREE-PHASE	RATED POWER		ABSORBED CURRENT* 380-415 V A	CAPACITOR μ F / 450 V	PANEL TYPE						
	kW	HP			QTD/...	Q3D/...					
SC205T	0,55	0,75	1,62	-	...11	...05					
SC207T	0,75	1	2,38	-	...11	...11					
SC209T	0,9	1,2	2,54	-	...15	...11					
SC211T	1,1	1,5	2,70	-	...15	...11					
SC407T	0,75	1	2,40	-	...11	...11					
SC409T	0,9	1,2	2,60	-	...15	...11					
SC411T	1,1	1,5	2,85	-	...15	...11					

*Maximum values within operating range.

scuba-sc2-sc4-2p50-en_b_tp

For different voltage (e.g. 220-240 V) please contact our network.



40S - L4C SERIES MOTORS MOTOR - CONTROL PANEL COMBINATION TABLE

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

40S-2p50-en_d_tc

MOTOR TYPE 40S - 4" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		QTD/...	Q3D/...	Q3I/...	Q3A/...	Q3SF/...	
	0,37	0,5	1,2	...03-05	...03-05	-	-	-	
	0,55	0,75	1,7	...05-07	...05-07	-	-	-	
	0,75	1	2,4	...05-07	...05-07	-	-	-	
	1,1	1,5	3,1	...07-15	...07-15	-	-	-	
	1,5	2	4,4	...15-22	...15-22	-	-	-	
	2,2	3	6,1	...15-22	...15-22	-	-	-	
	3	4	7,1	...22-40	...22-40	-	-	-	
	4	5,5	9,8	...22-40	...22-40	-	-	-	
	5,5	7,5	13,7	...40-75	...40-75	...40-75	...40-75	...75	
	7,5	10	18,7	...75-92	...75-92	...75-92	...75-92	...150	

For different voltages, please contact our sales network.

40S-2p50-en_d_tc

MOTOR TYPE L4C - 4" SINGLE-PHASE	RATED POWER		RATED CURRENT 220-240 V A	CAPACITOR μ F / 450 V	PANEL TYPE					
	kW	HP			QSM...	QPC...	QPCS...	QMC...	QMCS...	QSC...
	0,37	0,5	3,4	16	...03	...03	...03	...03	...03	-
	0,55	0,75	4,8	20	...05	...05	...05	...05	...05	-
	0,75	1	6,5	30	...07	...07	...07	...07	...07	-
	1,1	1,5	8,3	40	...11	...11	...11	...11	...11	-
	1,5	2	10,7	50	-	...15	...15	...15	...15	-
	2,2	3	15,3	70	-	...22	...22	...22	...22	-
	4	5,5	27,4	90	-	-	-	-	-	...40

L4c-2p50-en_g_tc

MOTOR TYPE L4C - 4" THREE-PHASE	RATED POWER		RATED CURRENT 380-415 V A	PANEL TYPE					
	kW	HP		QTD/...	Q3D/...	Q3I/...	Q3A/...	Q3SF/...	
	0,37	0,5	1,8	...05-07	...05-07	-	-	-	
	0,55	0,75	2	...05-07	...05-07	-	-	-	
	0,75	1	2,6	...07-15	...07-15	-	-	-	
	1,1	1,5	3,6	...07-15	...07-15	-	-	-	
	1,5	2	4,6	...15-22	...15-22	-	-	-	
	2,2	3	6,2	...15-22	...15-22	-	-	-	
	3	4	8,8	...22-40	...22-40	-	-	-	
	4	5,5	10,5	...40-75	...40-75	-	-	-	
	5,5	7,5	14,5	...40-75	...40-75	...40-75	...40-75	...75	
	7,5	10	18,1	...75-92	...75-92	...75-92	...75-92	...150	

For different voltages please contact our sales network

L4c-2p50-en_g_tc

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QSM Series

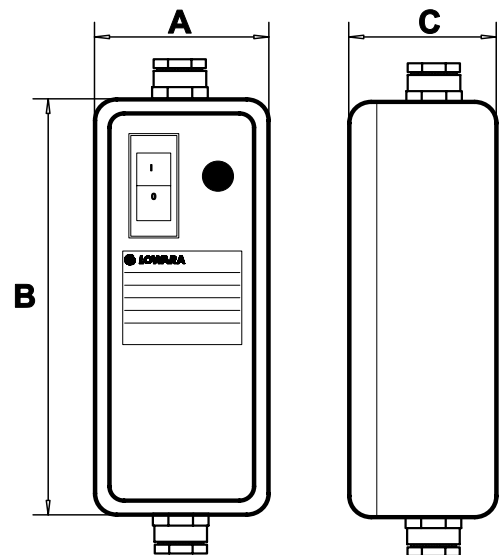


SPECIFICATIONS

- Main switch for manual control.
- Supply voltage: 1 x 220-240 V \pm 5%.
- Frequency: 50 Hz.
- Power: 0,25 to 1,1 kW.
- Direct motor start.
- 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.
- Plastic enclosure.
- Incorporated capacitor.
- Thermal protection with motor protector inside the panel.

OPTIONAL FEATURES

- QSM PF version with overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	CAPACITOR 450V uF	DIMENSIONS			WEIGHT Kg
		kW	HP			A mm	B mm	C mm	
QSM 02	220-240	0,25	0,33	2,6	12,5	80	210	65	0,45
QSM 03	220-240	0,37	0,5	3,4	16	80	210	65	0,45
QSM 05	220-240	0,55	0,75	4,8	20	80	210	65	0,45
QSM 07	220-240	0,75	1	6,5	30	80	210	65	0,45
QSM 11	220-240	1,1	1,5	8,3	40	80	210	65	0,45

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QPC Series

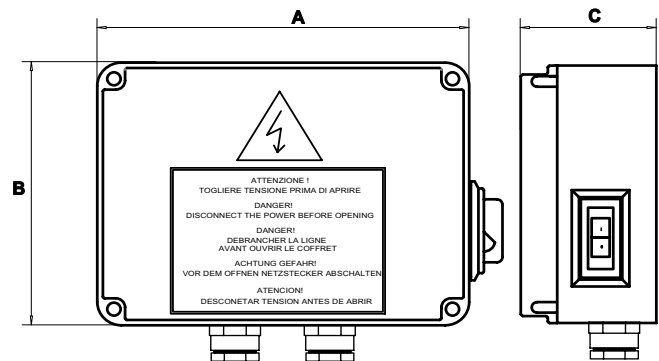


SPECIFICATIONS

- Main switch for manual control.
- Supply voltage: 1 x 230 V \pm 10%.
- Frequency: 50 Hz.
- Power: 0,25 to 2,2 kW.
- Direct motor start.
- 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 with fins.
- Plastic enclosure.
- Main switch with manual-reset thermal protection and power indicator light.

OPTIONAL ACCESSORIES

- DPF single-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg	CAPACITOR μ F/450V
		kW	HP		A mm	B mm	C mm		
QPC/02	1 x 230 V \pm 10 %	0,25	0,33	3	170	170	75	1,1	12,5
QPC/03	1 x 230 V \pm 10 %	0,37	0,5	4	170	170	75	1,1	16
QPC/05	1 x 230 V \pm 10 %	0,55	0,75	5	170	170	75	1,1	20
QPC/07	1 x 230 V \pm 10 %	0,75	1	6	170	170	75	1,1	30
QPC/11	1 x 230 V \pm 10 %	1,1	1,5	9	170	170	75	1,1	40
QPC/15	1 x 230 V \pm 10 %	1,5	2	11	170	170	75	1,1	50
QPC/22	1 x 230 V \pm 10 %	2,2	3	16	170	170	127	1,2	70

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QPCS Series



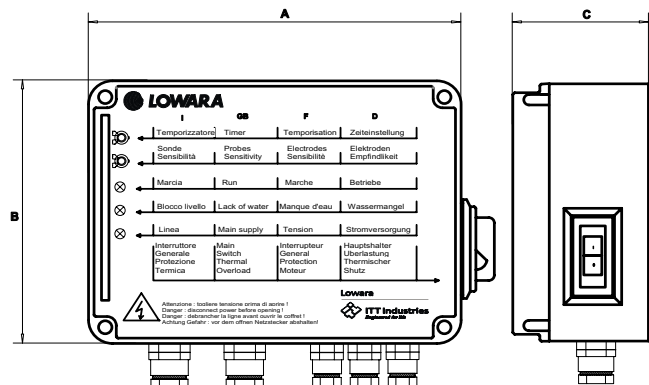
SPECIFICATIONS

- Automatic control through an external enable contact.
- Supply voltage: 1 x 230 V \pm 10%.
- Frequency: 50 Hz.
- Power: 0,25 to 2,2 kW.
- 12 V AC low-voltage auxiliary circuit.
- Direct motor start.
- 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 with fins.
- Plastic enclosure with transparent cover.
- Incorporated capacitor.

- Main switch with manual-reset thermal protection and power indicator light.
- Power, pump running, level control LED.
- Overvoltage discharges.
- Dry running control through probes or float or minimum pressure switch.

OPTIONAL ACCESSORIES

- Set of 3 electrodes (probes) without cable.
- Float.
- Pressure switch.



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg	CAPACITOR μ F/450V
		kW	HP		A	B	C		
QPCS/02	1 x 230 V \pm 10 %	0,25	0,33	3	200	150	80	1,3	12,5
QPCS/03	1 x 230 V \pm 10 %	0,37	0,5	4	200	150	80	1,3	16
QPCS/05	1 x 230 V \pm 10 %	0,55	0,75	5	200	150	80	1,3	20
QPCS/07	1 x 230 V \pm 10 %	0,75	1	6	200	150	80	1,3	30
QPCS/11	1 x 230 V \pm 10 %	1,1	1,5	9	200	150	80	1,3	40
QPCS/15	1 x 230 V \pm 10 %	1,5	2	11	200	150	80	1,3	50
QPCS/22	1 x 230 V \pm 10 %	2,2	3	16	200	150	80	1,3	70

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QMC Series

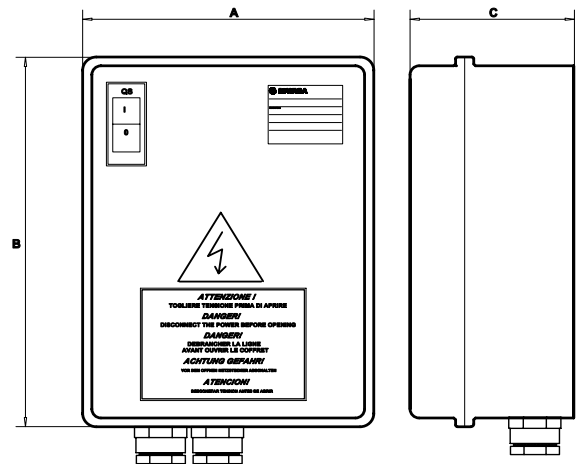


SPECIFICATIONS

- Main switch for manual control.
- Supply voltage: 1 x 230 V \pm 10%.
- Frequency: 50 Hz.
- Power: 0,25 to 2,2 kW.
- Direct motor start.
- 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.
- Incorporated capacitor.
- Main switch with manual-reset thermal protection and power indicator light.

OPTIONAL ACCESSORIES

- DPF single-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg	CAPACITOR μ F/450V
		kW	HP		A	B	C		
QMC/02	1 x 230 V \pm 10 %	0,25	0,33	3	170	200	105	2,5	12,5
QMC/03	1 x 230 V \pm 10 %	0,37	0,5	4	170	200	105	2,5	16
QMC/05	1 x 230 V \pm 10 %	0,55	0,75	5	170	200	105	2,5	20
QMC/07	1 x 230 V \pm 10 %	0,75	1	6	170	200	105	2,5	30
QMC/11	1 x 230 V \pm 10 %	1,1	1,5	9	170	200	105	2,5	40
QMC/15	1 x 230 V \pm 10 %	1,5	2	11	170	200	105	2,5	50
QMC/22	1 x 230 V \pm 10 %	2,2	3	16	235	265	150	2,8	70

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QMCS Series



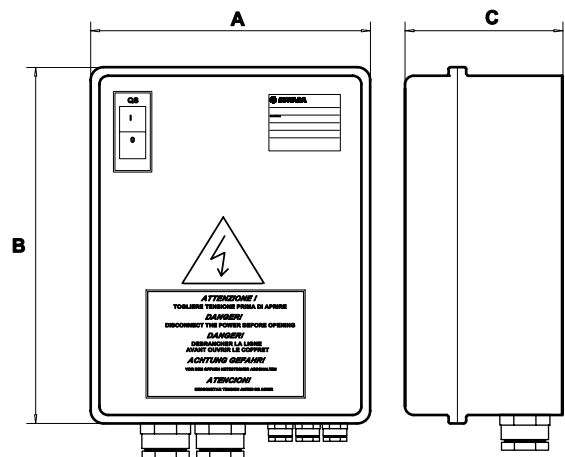
SPECIFICATIONS

- Automatic control through an external enable contact.
- Supply voltage: 1 x 230 V \pm 10%.
- Frequency: 50 Hz.
- Power: 0,25 to 2,2 kW.
- Direct motor start.
- 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.
- Incorporated capacitor.

- Main switch with manual-reset thermal protection and power indicator light.
- Dry running control with float or minimum pressure switch (available separately).

OPTIONAL ACCESSORIES

- DPF single-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).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg	CAPACITOR μ F/450V
		kW	HP		A mm	B mm	C mm		
QMCS/02	1 x 230 V \pm 10 %	0,25	0,33	3	235	265	150	4	12,5
QMCS/03	1 x 230 V \pm 10 %	0,37	0,5	4	235	265	150	4	16
QMCS/05	1 x 230 V \pm 10 %	0,55	0,75	5	235	265	150	4	20
QMCS/07	1 x 230 V \pm 10 %	0,75	1	6	235	265	150	4	30
QMCS/11	1 x 230 V \pm 10 %	1,1	1,5	9	235	265	150	4	40
QMCS/15	1 x 230 V \pm 10 %	1,5	2	11	235	265	150	4	50
QMCS/22	1 x 230 V \pm 10 %	2,2	3	16	250	320	150	4,2	70

Single-phase Electric Panel

APPLICATIONS

- Protection and control of a single-phase submersible electric pump for 4" wells.

QSC Series

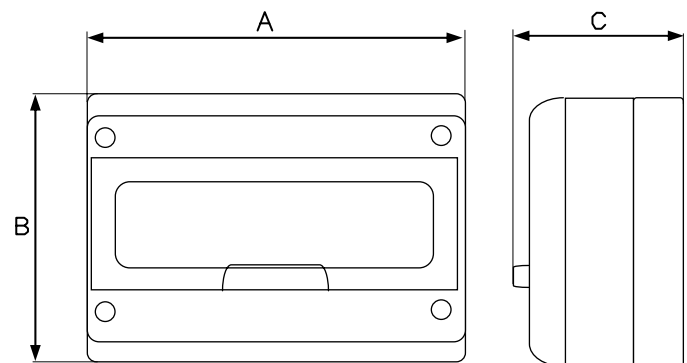


SPECIFICATIONS

- Main switch for manual control.
- Supply voltage: 1 x 230 V \pm 10%.
- Frequency: 50 Hz.
- Power: 0,25 to 4 kW.
- Direct motor start.
- 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.
- Incorporated capacitor.
- Main switch with manual-reset thermal protection.

OPTIONAL ACCESSORIES

- DPF single-phase module for overvoltage protection (lightning protector).



MODEL	RATED VOLTAGE V	RATED POWER		RATED CURRENT A	DIMENSIONS			WEIGHT Kg	CAPACITOR μ F/450V
		kW	HP		A mm	B mm	C mm		
QSC/02	1 x 230 V \pm 10 %	0,25	0,33	2,5 \div 4	280	220	160	2	12,5
QSC/03	1 x 230 V \pm 10 %	0,37	0,5	4 \div 6,3	280	220	160	2	16
QSC/05	1 x 230 V \pm 10 %	0,55	0,75	4 \div 6,3	280	220	160	2	20
QSC/07	1 x 230 V \pm 10 %	0,75	1	4 \div 6,3	280	220	160	2	30
QSC/11	1 x 230 V \pm 10 %	1,1	1,5	6,3 \div 10	280	220	160	2	40
QSC/15	1 x 230 V \pm 10 %	1,5	2	10 \div 16	280	220	160	2	50
QSC/22	1 x 230 V \pm 10 %	2,2	3	16 \div 20	280	220	160	2	70
QSC/40	1 x 230 V \pm 10 %	4	5,5	24 \div 32	280	370	160	3	90

Three-phase Electric Panel

APPLICATIONS

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

QTD Series



SPECIFICATIONS

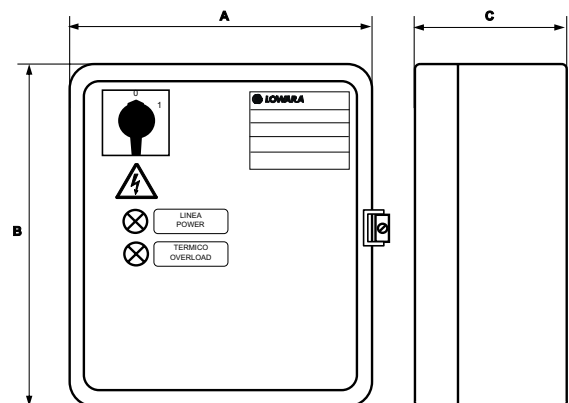
- Control through an external enable contact.
- Supply voltage: 3 x 400 V \pm 10%.
- Frequency: 50/60 Hz.
- Power: 0,25 to 9,2 kW.
- Direct motor start.
- Short-circuit and overload protection.
- Protection class: IP54.
- Ambient temperature: -5 to +40 °C (according to EN 60439-1).
- Maximum relative 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



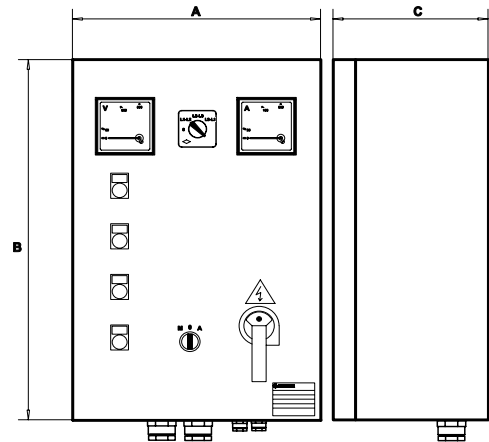
SPECIFICATIONS

- 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

Q3I Series



APPLICATIONS

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

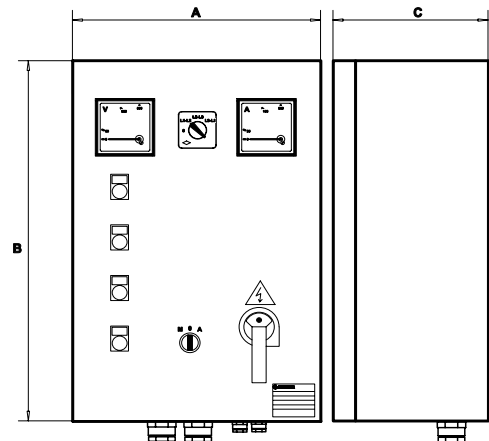
SPECIFICATIONS

- Manual control through an Auto/Man selector switch.
- Automatic control through an external enable contact.
- Supply voltage: 3 x 400 V \pm 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 \pm 10 %	4-7,5	5,5-10	10 \div 16	400	600	250	35
Q3I/75-92	3 x 400 V \pm 10 %	7,5-9,2	10-12,5	16 \div 20	400	600	250	35
Q3I/92-110	3 x 400 V \pm 10 %	9,2-11	12,5-15	20 \div 25	400	600	250	35
Q3I/110-150	3 x 400 V \pm 10 %	11-15	15-20	22 \div 32	500	700	250	50
Q3I/150-185	3 x 400 V \pm 10 %	15-18,5	20-25	28 \div 40	500	700	250	50
Q3I/185-220	3 x 400 V \pm 10 %	18,5-22	25-30	36 \div 50	500	700	250	50
Q3I/220-300	3 x 400 V \pm 10 %	22-30	30-40	45 \div 63	500	700	250	65
Q3I/300-370	3 x 400 V \pm 10 %	30-37	40-50	57 \div 75	500	700	250	65
Q3I/370-450	3 x 400 V \pm 10 %	37-45	50-60	70 \div 90	600	900	250	65
Q3I/450-550	3 x 400 V \pm 10 %	45-55	60-75	80 \div 108	600p	1300p	300p	100
Q3I/550-750	3 x 400 V \pm 10 %	55-75	75-100	105 \div 138	600p	1300p	300p	100
Q3I/750-900	3 x 400 V \pm 10 %	75-90	100-125	138 \div 185	600p	1500p	300p	100
Q3I/900-1100	3 x 400 V \pm 10 %	90-110	125-150	175 \div 210	600p	1500p	300p	100
Q3I/1100-1320	3 x 400 V \pm 10 %	110-132	150-180	210 \div 260	800p	1700p	400p	150
Q3I/1320-1600	3 x 400 V \pm 10 %	132-160	180-218	250 \div 305	800p	1700p	400p	150
Q3I/1600-2000	3 x 400 V \pm 10 %	160-200	218-273	290 \div 400	800p	1900p	400p	160
Q3I/2000-2500	3 x 400 V \pm 10 %	200-250	273-340	400 \div 460	1000p	1900p	400p	180
Q3I/2500-3150	3 x 400 V \pm 10 %	250-315	340-430	450 \div 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.

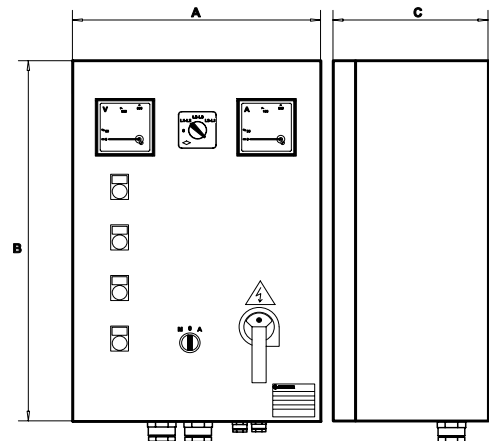
SPECIFICATIONS

- 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.

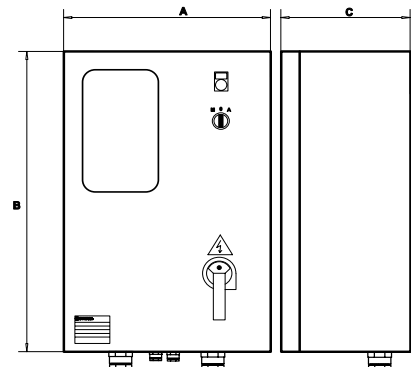
Protections against phase failure / phase sequence / frequency out of limits on power supply line.
 Low-voltage protection on auxiliary circuits.
 Protection against starter overtemperature / overload / malfunction.
 Protection against overload / locked rotor / current asymmetry on motor side.
 Short-circuit 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.

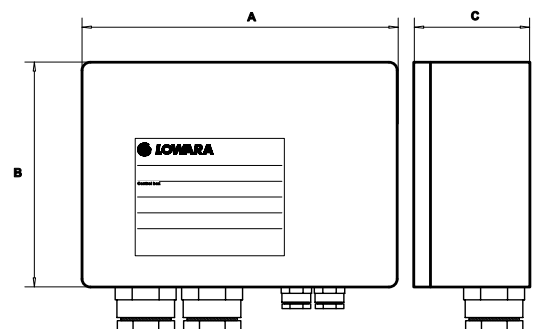
For connection of the electrodes to the panel we recommend the following cross sections:

LENGHT m		CABLE CROSS SECTION mm ²
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 ²
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.

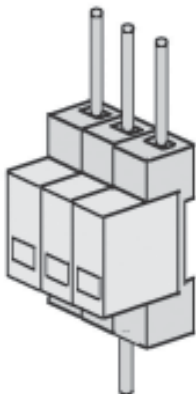
VR Series



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

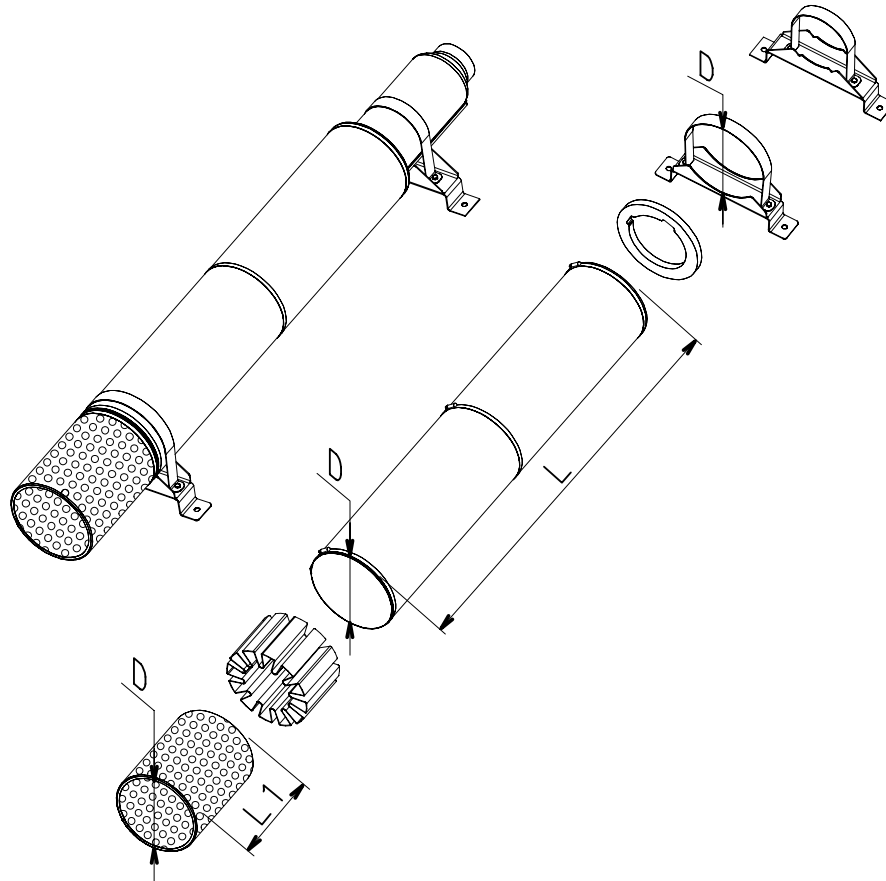


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Lowara

COOLING SHROUDS

01890_B_DD



PUMP TYPE	MOTOR TYPE		COOLING SET SHROUD (D x L)	COOLING SET FILTER (D x L1)	COOLING SET BRACKETS (D)
	40S/B	L4C			
1GSL 2GS 4GS 6GS 8GS 12GS	0,37	0,37	D115X500	D115X117	D115/2 - 2PZ
	0,55	0,55			
	0,75	0,75			
	1,1	1,1	D115X800	D115X117	D115 - 2PZ
	1,5	1,5			
	2,2	2,2			
	3	3			
	4	4			
5,5	5,5	D115X1000	D115X117	D115 - 2PZ	
7,5	7,5				
16GS	2,2	2,2	D145X800	D145X158	D145 - 2PZ
	3	3			
	4	4			
	5,5	5,5	D145X1000	D145X158	D145 - 2PZ
	7,5	7,5			

gs_kit-raf50-en_b_ta



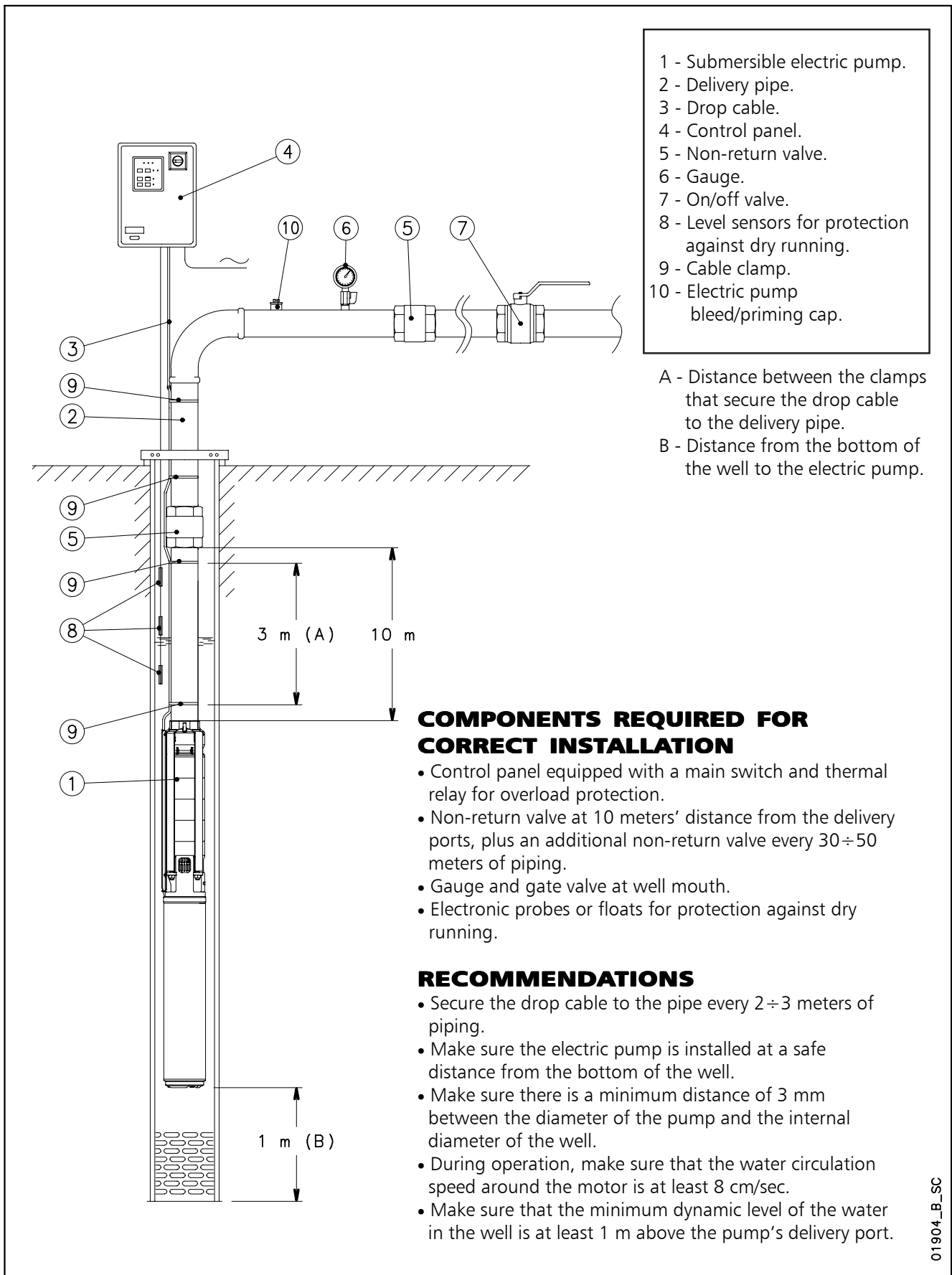
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Lowara

TECHNICAL APPENDIX



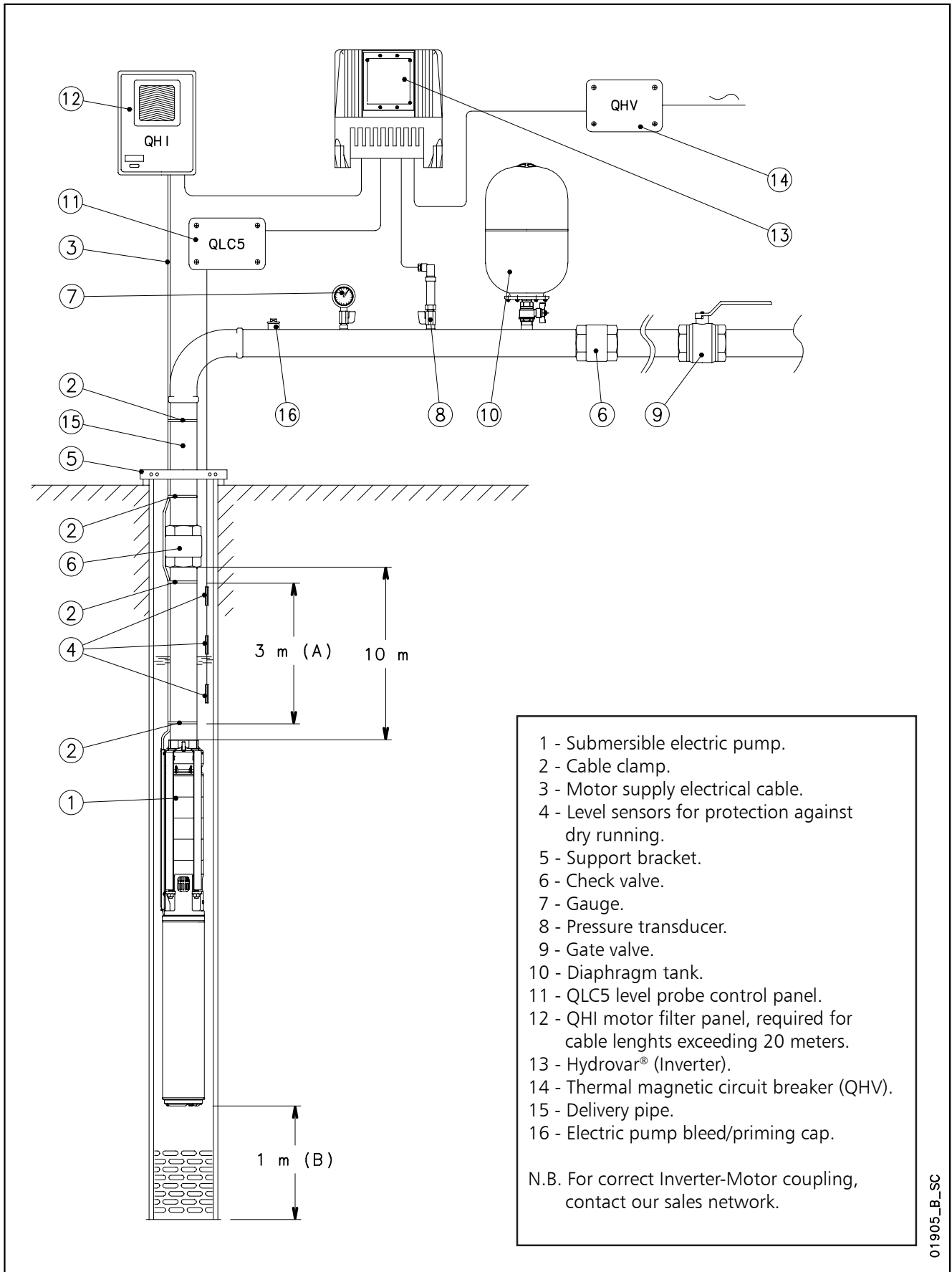
SUBMERSIBLE ELECTRIC PUMP INSTALLATION DIAGRAM



01904_B_SC



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



40S SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C					
		30	35	40	45	50	55
40S	all models	1	1	0,9	0,8	0,7	0,6

40S-derating-50-en_a_te

EXAMPLE:

A 2,2 kW 40S motor is to be used in 50°C water.

Motor power at 50 °C = 2,2 x 0,7 = 1,54 kW

L4C SERIES MOTORS

TABLE OF POWER REDUCTION COEFFICIENTS WITH INCREASED WATER TEMPERATURE

MOTOR TYPE	RATED POWER kW	TEMPERATURE °C					
		30	35	40	45	50	55
L4C	all models	1	1	0,95	0,9	0,85	0,8

L4C-derating-50-en_b_te

EXAMPLE:

A 2,2 kW L4C motor is to be used in 50°C water.

Motor power at 50 °C = 2,2 x 0,85 = 1,87 kW

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 mm² 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.



SCUBA, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPYLENE (EPR) CABLES DIRECT START

PUMP TYPE	RATED POWER		RATED VOLTAGE	Cos φ	ABSORBED CURRENT	VOLTAGE DROP	CABLE GAUGE: 3 x ...mm ²											
							mm ²	1	1,5	2,5	4	6	10	16	25			
							A max	17	23	32	42	54	75	100	127			
SINGLE-PHASE	Kw	HP	V		A	%	Maximum length in metres											
SC205	0,55	0,75	220	0,944	4,37	4		53	80	133	213							
			240	0,940	4,37			58	88	146	234							
SC207	0,75	1	220	0,968	5,19			44	66	109	175	263						
			240	0,968	5,19			48	72	119	191	287						
SC209	0,9	1,2	220	0,979	5,88			38	57	96	153	229						
			240	0,979	5,88			42	63	104	167	250						
SC211	1,1	1,5	220	0,981	7,25			31	46	77	124	186	309					
			240	0,981	7,25			34	51	84	135	202	337					
SC407	0,75	1	220	0,970	5,28			43	64	107	172	258						
			240	0,970	5,28			47	70	117	187	281						
SC409	0,9	1,2	220	0,982	6,17			36	54	91	145	218	363					
			240	0,982	6,17			40	59	99	158	238	396					
SC411	1,1	1,5	220	0,984	7,85			28	43	71	114	171	285	456				
			240	0,984	7,85			31	47	78	124	186	311	497				

Posa in aria libera alla temperatura di 30°C, temperatura massima del conduttore di 80°C.

Scubam-cavi-50_d_te

PUMP TYPE	RATED POWER		RATED VOLTAGE	Cos φ	ABSORBED CURRENT	VOLTAGE DROP	CABLE GAUGE: 4 x ...mm ²											
							mm ²	1	1,5	2,5	4	6	10	16	25			
							A max	17	23	32	42	54	75	100	127			
THREE-PHASE	Kw	HP	V		A	%	Maximum length in metres											
SC205T	0,55	0,75	220	0,809	2,81	4		125	188	313								
			240	0,809	2,81			136	205	341								
			380	0,809	1,62			375										
			415	0,809	1,62			409										
SC207T	0,75	1	220	0,728	4,12			95	142	237	379							
			240	0,728	4,12			103	155	258	414							
			380	0,728	2,38			283										
			415	0,728	2,38			309										
SC209T	0,9	1,2	220	0,776	4,4			83	125	208	333							
			240	0,776	4,4			91	136	227	363							
			380	0,776	2,54			249	374									
			415	0,776	2,54			272	408									
SC211T	1,10	2	220	0,810	4,68			75	112	187	300							
			240	0,810	4,68			82	123	204	327							
			380	0,810	2,7			224	337									
			415	0,810	2,7			245	368									
SC407T	0,75	1	220	0,737	4,16		93	139	232	371								
			240	0,737	4,16		101	152	253	405								
			380	0,737	2,4		278	416										
			415	0,737	2,4		303	455										
SC409T	0,9	1,2	220	0,793	4,5		80	119	199	319								
			240	0,793	4,5		87	130	217	348								
			380	0,793	2,6		238	357										
			415	0,793	2,6		260	390										
SC411T	1,1	1,5	220	0,833	4,94		69	104	173	276	414							
			240	0,833	4,94		75	113	188	301	452							
			380	0,833	2,85		207	310										
			415	0,833	2,85		226	339										

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

Scubat-cavi-50-en_d_te



4OS SINGLE-PHASE, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES DIRECT START

MOTOR TYPE	RATED POWER		RATED VOLTAGE	Cos φ	RATED CURRENT	VOLTAGE DROP %	Cable cross section: 4G x ...mm ²								
							mm ²	1	1,5	2,5	4	6	10	16	25
							A max	17	23	32	42	54	75	100	127
SINGLE-PHASE	Kw	HP	V		A	4	Maximum lenght in metres								
							75	112	186	298					
							78	117	196	313					
4OS03M235	0,37	0,5	220	0,98	3,0		82	122	204	327					
			230	0,96	3,1		55	83	138	221	331				
			240	0,93	3,2		58	87	145	232	348				
4OS05M235	0,55	0,75	220	0,98	4,1		61	92	153	246	368				
			230	0,96	4,1		41	61	102	163	245				
			240	0,92	4,3		44	65	109	174	261				
4OS07M235	0,75	1	220	0,99	5,4		46	69	114	183	275				
			230	0,97	5,5		30	45	75	119	179	298			
			240	0,94	5,6		32	48	80	127	191	318			
4OS11M235	1,1	1,5	220	0,99	7,5		33	50	84	134	201	335			
			230	0,98	7,4		22	34	56	90	135	224	359		
			240	0,95	7,6		24	36	59	95	142	237	380		
4OS15M235	1,5	2	220	0,98	10,0		25	37	62	99	149	248	398		
			230	0,96	10,1		16	23	39	62	93	155	249		
			240	0,92	10,5		17	25	42	67	101	168	269		
4OS22M235	2,2	3	220	0,99	14,3		18	27	44	71	106	177	284		
			230	0,97	14,1		-	-	22	36	54	89	143	223	
			240	0,94	14,4		-	-	25	39	59	98	157	246	
4OS40M235	4	5,5	220	0,96	25,7		-	-	26	42	63	105	168	263	
			230	0,94	24,9										
			240	0,92	24,8										

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

4osm-b-cavi-50-en_b_te



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Lowara

**4OS THREE-PHASE, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPILENE (EPR) CABLES
DIRECT START**

MOTOR TYPE	RATED POWER		RATED VOLTAGE	Cos φ	RATED CURRENT	VOLTAGE DROP %	Cable cross section: 4G x ...mm ²												
							mm ²	1	1,5	2,5	4	6	10	16	25				
							A max	17	23	32	42	54	75	100	127				
THREE-PHASE	Kw	HP	V		A		Maximum lenght in metres												
4OS03T235	0,37	0,5	220	0,78	2,0	4		179	268										
			230	0,72	2,1			198	298										
			240	0,68	2,2			212	318										
4OS05T235	0,55	0,75	220	0,8	2,8			127	191	318									
			230	0,75	2,9			139	208	346									
			240	0,71	3,0			148	221	369									
4OS07T235	0,75	1	220	0,78	3,8			97	145	242									
			230	0,71	4,0			106	159	265									
			240	0,67	4,2			111	167	278									
4OS11T235	1,1	1,5	220	0,8	5,1			70	105	176	281								
			230	0,74	5,2			78	116	194	310								
			240	0,7	5,4			82	123	204	327								
4OS15T235	1,5	2	220	0,78	7,0			52	79	131	210	315							
			230	0,72	7,2			57	86	143	228	342							
			240	0,68	7,6			60	90	149	239	358							
4OS22T235	2,2	3	220	0,80	9,7			37	55	91	146	219	366						
			230	0,74	10,0			40	60	100	161	241	402						
			240	0,69	10,5			43	64	107	171	257	428						
4OS30T235	3	4	220	0,85	12,1			28	41	69	111	166	276						
			230	0,81	12,0			31	46	76	122	183	306						
			240	0,77	12,3			33	49	82	131	196	327						
4OS40T235	4	5,5	220	0,85	16,4			-	31	51	82	122	204	326					
			230	0,80	16,5			-	34	56	90	135	225	360					
			240	0,76	17,0			-	36	60	96	144	240	384					
4OS55T235	5,5	7,5	220	0,83	22,9			-	-	37	60	90	150	239					
			230	0,78	23,0			-	-	41	66	99	166	265					
			240	0,73	23,7			-	-	45	72	108	179	287					
4OS75T235	7,5	10	220	0,82	31,0			-	-	-	45	67	112	179	280				
			230	0,76	31,4			-	-	-	50	75	125	199	311				
			240	0,71	32,4			-	-	-	54	81	135	216	337				
4OS03T405	0,37	0,5	380	0,78	1,2			533											
			400	0,72	1,2			598											
			415	0,68	1,2			636											
4OS05T405	0,55	0,75	380	0,8	1,6			381											
			400	0,75	1,7			418											
			415	0,71	1,7			442											
4OS07T405	0,75	1	380	0,78	2,2			286											
			400	0,71	2,3			316											
			415	0,67	2,4			333											
4OS11T405	1,1	1,5	380	0,8	2,9			212	317										
			400	0,74	3,0			233	349										
			415	0,7	3,1			247	371										
4OS15T405	1,5	2	380	0,78	4,0			157	236	393									
			400	0,72	4,2			171	256	427									
			415	0,68	4,4			179	269	448									
4OS22T405	2,2	3	380	0,80	5,6			110	164	274									
			400	0,74	5,8			120	181	301									
			415	0,69	6,1			127	191	318									
4OS30T405	3	4	380	0,85	7,0			83	124	206	330								
			400	0,81	7,0			91	137	228	365								
			415	0,77	7,1			98	147	245	392								
4OS40T405	4	5,5	380	0,85	9,5			61	91	152	243	365							
			400	0,80	9,5			68	102	170	272	408							
			415	0,76	9,8			72	108	180	288	432							
4OS55T405	5,5	7,5	380	0,83	13,2			45	67	112	179	269							
			400	0,78	13,3			50	75	125	199	299							
			415	0,73	13,7			54	80	134	214	322							
4OS75T405	7,5	10	380	0,82	17,9			-	50	84	134	201	334						
			400	0,76	18,1			-	56	94	150	225	376						
			415	0,71	18,7			-	61	101	162	242	404						

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

4os-b-cavi-50-en_a_te



L4C SINGLE-PHASE, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPYLENE (EPR) CABLES DIRECT START

MOTOR TYPE SINGLE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	RATED CURRENT A	VOLTAGE DROP %	Cable cross section: 4G x ...mm ²								
	Kw	HP					mm ²	1	1,5	2,5	4	6	10	16	25
	A max	17					23	32	42	54	75	100	127		
							Maximum lenght in metres								
L4C03M235	0,37	0,5	220	0,96	3,2	4		72	107	179	286				
			230	0,97	3,3			72	108	180	287				
			240	0,91	3,4			78	116	194	310				
L4C05M235	0,55	0,75	220	0,95	4,3			54	81	135	215	323			
			230	0,94	4,6			53	80	133	213	319			
			240	0,9	4,8			56	83	139	222	333			
L4C07M235	0,75	1	220	0,93	6			39	59	99	158	237			
			230	0,92	6,2			40	60	101	161	242			
			240	0,85	6,5			43	65	109	174	261			
L4C11M235	1,1	1,5	220	0,94	8,1			29	43	72	116	173	289		
			230	0,92	8,1			31	46	77	123	185	309		
			240	0,87	8,3			33	50	83	133	199	332		
L4C15M235	1,5	2	220	0,96	10,4		22	33	55	88	132	220	353		
			230	0,93	10,4		24	36	59	95	143	238	380		
			240	0,9	10,7		25	37	62	100	150	249	399		
L4C22M235	2,2	3	220	0,96	15,4		-	22	37	60	89	149	238		
			230	0,94	15		-	24	41	65	98	163	261		
			240	0,91	15,3		-	26	43	69	103	172	276		
L4C40M235	4	5,5	220	0,94	24,5		-	-	24	38	57	96	153	239	
			230	0,95	25		-	-	24	39	58	97	155	242	
			240	0,84	27,4		-	-	26	42	63	104	167	261	

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

l4cm-cavi-50-en_c_te

L4C THREE-PHASE, 50 Hz: SIZING OF POLYCHLOROPRENE (CR) H07RN-F AND ETHYLENE-PROPYLENE (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 ²											
	Kw	HP					mm ²	1	1,5	2,5	4	6	10	16	25			
	A max	17					23	32	42	54	75	100	127					
							Maximum length in metres											
L4C03T235	0,37	0,5	220	0,69	2,6	4		158	238	396								
			230	0,7	2,7			157	236	393								
			240	0,67	3,1			149	224	373								
L4C05T235	0,55	0,75	220	0,77	3,1			119	179	298								
			230	0,71	3,3			127	190	317								
			240	0,66	3,5			134	201	336								
L4C07T235	0,75	1	220	0,77	4			92	138	231	369							
			230	0,73	4,1			99	149	248	397							
			240	0,66	4,5			104	157	261	418							
L4C11T235	1,1	1,5	220	0,8	5,6			63	95	159	254	381						
			230	0,76	5,7			69	103	171	274	412						
			240	0,73	6,2			69	103	171	274	411						
L4C15T235	1,5	2	220	0,77	7,4			50	75	125	200	299						
			230	0,72	7,6			54	81	136	217	326						
			240	0,68	8			57	86	143	228	342						
L4C22T235	2,2	3	220	0,8	10		36	53	89	142	213	355						
			230	0,78	10,2		37	56	93	149	224	374						
			240	0,7	10,7		41	62	103	166	248	414						
L4C30T235	3	4	220	0,77	13,7		27	40	67	108	162	269						
			230	0,71	14,3		29	44	73	117	176	293						
			240	0,68	15,2		-	45	75	120	180	300						
L4C40T235	4	5,5	220	0,81	16,4		-	32	53	86	128	214	342					
			230	0,79	17,3		-	33	54	87	130	217	348					
			240	0,74	18,2		-	35	58	92	138	230	368					
L4C55T235	5,5	7,5	220	0,79	23,4		-	-	38	62	92	154	246	384				
			230	0,74	24,2		-	-	41	66	100	166	265	415				
			240	0,7	25		-	-	44	71	106	177	284	443				
L4C03T405	0,37	0,5	380	0,69	1,5		474											
			400	0,7	1,6		461											
			415	0,67	1,8		445											
L4C05T405	0,55	0,75	380	0,77	1,8		354											
			400	0,71	1,9		383											
			415	0,66	2		406											
L4C07T405	0,75	1	380	0,77	2,3		277	416										
			400	0,73	2,4		295	442										
			415	0,66	2,6		312	469										
L4C11T405	1,1	1,5	380	0,8	3,3		186	279										
			400	0,76	3,4		200	300										
			415	0,73	3,6		204	306										
L4C15T405	1,5	2	380	0,77	4,3		148	222	371									
			400	0,72	4,4		163	245	408									
			415	0,68	4,6		171	257	429									
L4C22T405	2,2	3	380	0,8	5,8		106	159	265									
			400	0,78	5,9		112	168	281									
			415	0,7	6,2		124	185	309									
L4C30T405	3	4	380	0,77	7,9		81	121	202	323								
			400	0,71	8,3		88	132	219	351								
			415	0,68	8,8		90	134	224	358								
L4C40T405	4	5,5	380	0,81	9,5		64	96	160	255	383							
			400	0,79	10		65	98	164	262	393							
			415	0,74	10,5		69	104	173	276	414							
L4C55T405	5,5	7,5	380	0,79	13,5		46	69	115	184	276							
			400	0,74	14		50	75	125	200	299							
			415	0,7	14,5		53	79	132	211	317							
L4C75T405	7,5	10	380	0,84	17		-	52	86	138	206	344						
			400	0,79	17,4		-	56	94	150	226	376						
			415	0,75	18,1		-	59	99	158	237	395						

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

l4c-cavi-50-en_c_te



JOINT BETWEEN DROP CABLE AND MOTOR CABLE

MOTOR TYPE	POWER kW	TYPE OF JOINT	FOUR-CORE DROP CABLE - SECTION (mm ²)															
			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)															

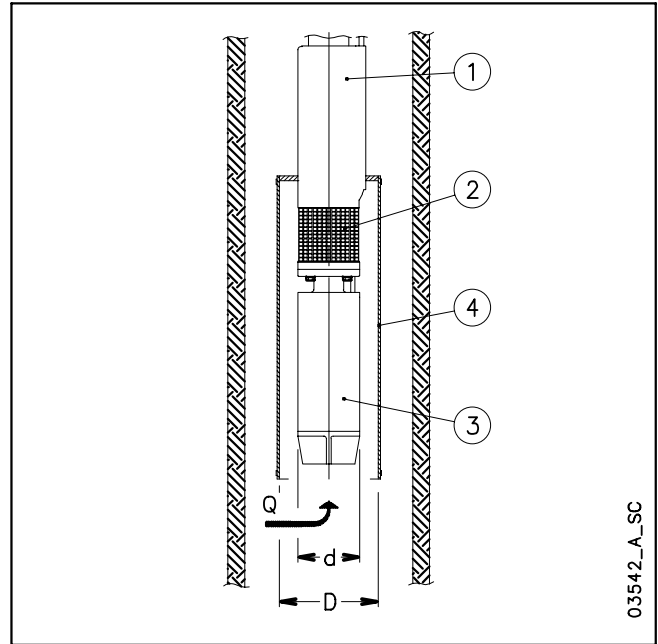
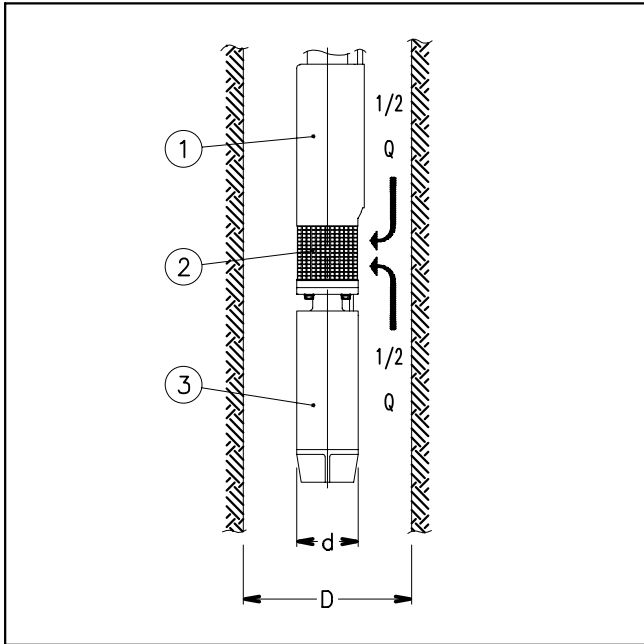
MOTOR TYPE	POWER kW	TYPE OF JOINT	THREE-CORE DROP CABLE - SECTION (mm ²)															
			1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
L6C L6W	4 - 37	Resin-filled method	GR2	GR2	GR2 GR6	GR2 GR6	GR2 GR6	GR6 GR7	GR6 GR7	GR7 GR5	GR5	GR5	GR5	-	-	-	-	-
		Heat-shrink method	GT1	GT1	GT2	GT2	GT3	GT4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

MOTOR TYPE	POWER kW	TYPE OF JOINT	SINGLE-CORE DROP CABLE - SECTION (mm ²)															
			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.

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



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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 [m³/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_m): if v ≥ v_m it means that the motor is properly cooled, if v < v_m will be necessary to mount a cooling sleeve (4).

Example:

An electric pump OZ630/12 (motor diameter d = 0.144 m) operates in an 8" well (well diameter D = 0.203 m) with flow rate Q = 20 m³/h = 0.0055 m³/s.

Speed of fluid v = (0.0055/2) / {π·[(0.203)²/4 – (0.144)²/4]} = 0.17 m/s.

The minimum speed required for proper motor cooling is v_m = 0.20 m/s.

Because v < v_m, it will be necessary to mount a cooling sleeve.

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

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

Where: Q in [m³/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_m 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 m³/h = 0.0042 m³/s, requires a minimum speed of the fluid of v_m = 0.20 m/s.

Cooling sleeve diameter D = {4·[(0.0042/(0.2·π)+(0.144)²/4]}^{0.5} = 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.

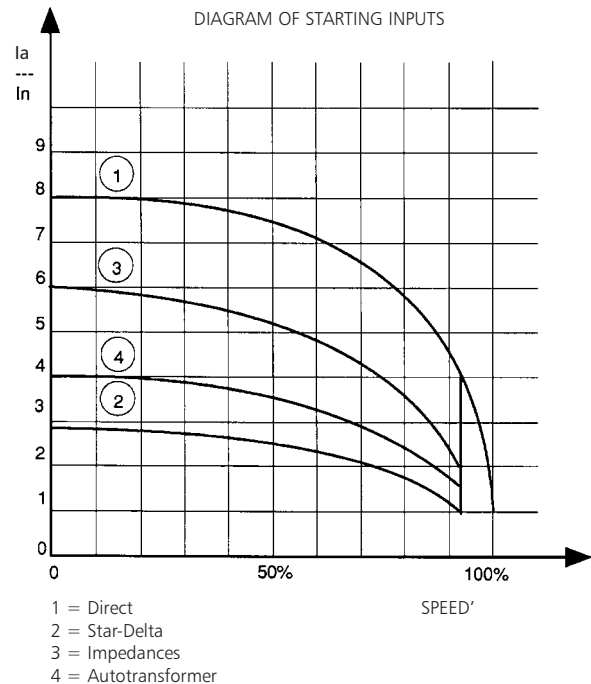
$$\text{Rated voltage } U_n = 400 \text{ V}$$

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.

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

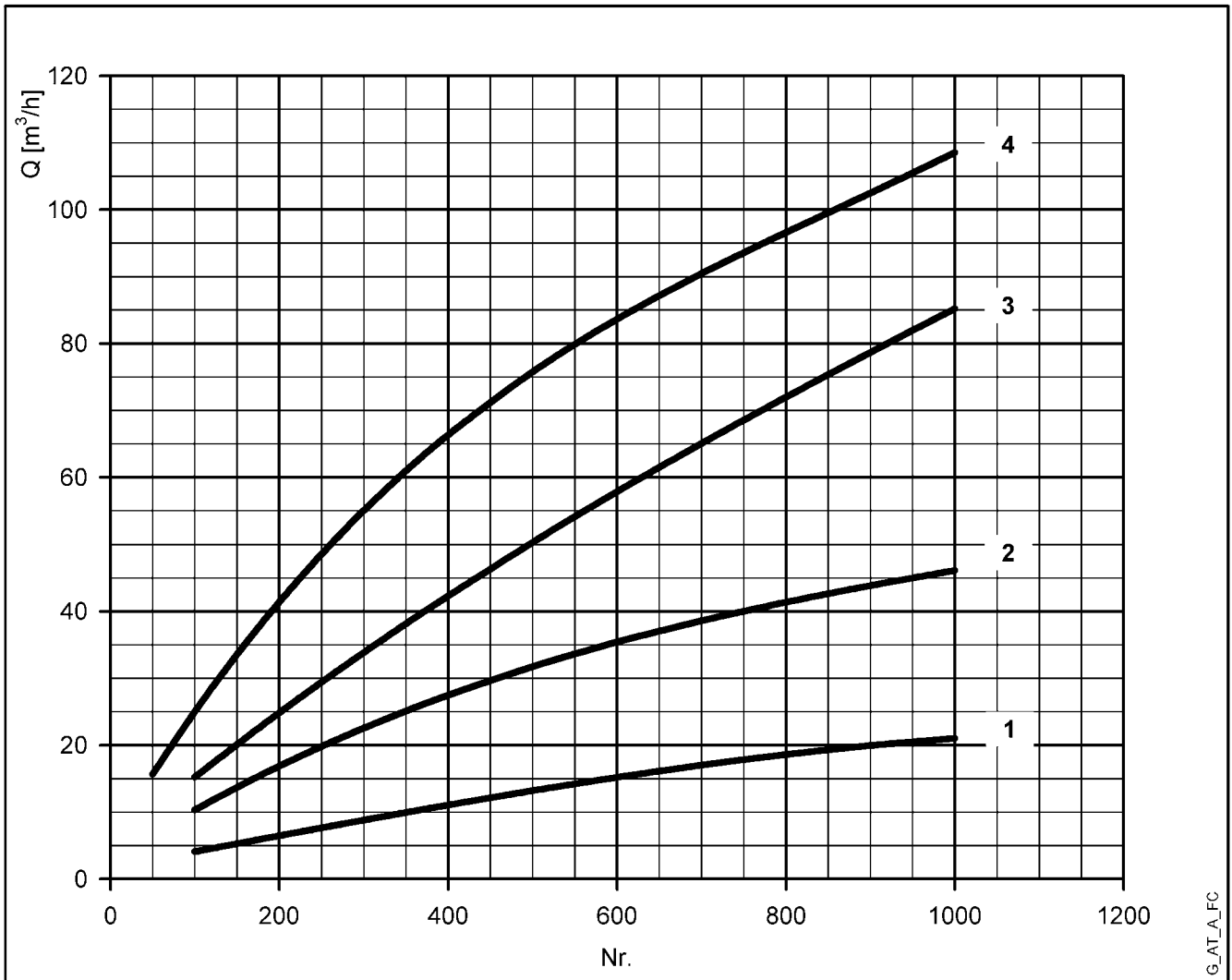
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WATER REQUIREMENTS FOR COMMUNITY BUILDINGS

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:

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

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 80-81 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 m³/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 m³/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 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.



TECHNICAL APPENDIX VAPOUR PRESSURE PS VAPOUR PRESSURE AND ρ DENSITY OF WATER TABLE

t °C	T K	ps bar	ρ kg/dm ³	t °C	T K	ps bar	ρ kg/dm ³	t °C	T K	ps bar	ρ kg/dm ³
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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Lowara

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 ³ /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	The hr values must be multiplied by: 0.71 for galvanized or painted steel pipes 0.54 for stainless steel or copper pipes 0.47 for PVC or PE pipes																							
		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	0,71								
		hr																59,5	20,1	8,26	3,90	2,03	0,69	0,28							
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
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

G-at-pct_a_th

hr = flow resistance for 100m of straight pipeline (m)
V = water speed (m/s)

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

G-a-pcv_a_th

The table is valid for the Hazen Williams coefficient $C = 100$ (cast iron pipework). For steel pipework, multiply the values by 1.41. For stainless steel, copper and coated cast iron pipework, multiply the values by 1.85.

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

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



VOLUMETRIC CAPACITY

Litres per minute l/min	Cubic metres per hour m ³ /h	Cubic feet per hour ft ³ /h	Cubic feet per minute ft ³ /min	Imp. gal. per minute Imp. gal./min	US gal. per minute Us gal./min
1,0000	0,0600	2,1189	0,0353	0,2200	0,2640
16,6667	1,0000	35,3147	0,5886	3,6660	4,4030
0,4720	0,0283	1,0000	0,0167	0,1040	0,1250
28,3170	1,6990	60,0000	1,0000	6,2290	7,4800
4,5460	0,2728	9,6326	0,1605	1,0000	1,2010
3,7850	0,2271	8,0209	0,1337	0,8330	1,0000

PRESSURE AND HEAD

Newton per square metre N/m ²	kilo Pascal kPa	bar bar	Pound force per square inch psi	metre of water m H ₂ O	millimetre di mercury mm Hg
1,0000	0,0010	1 x 10 ⁻⁵	1,45 x 10 ⁻⁴	1,02 x 10 ⁻⁴	0,0075
1000,0000	1,0000	0,0100	0,1450	0,1020	7,5000
1 x 10 ⁵	100,0000	1,0000	14,5000	10,2000	750,1000
6895,0000	6,8950	0,0690	1,0000	0,7030	51,7200
9789,0000	9,7890	0,0980	1,4200	1,0000	73,4200
133,3000	0,1333	0,0013	0,0190	0,0140	1,0000

LENGHT

millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
1,0000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	1,0000	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	1,0000	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	1,0000	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	1,0000	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	1,0000

VOLUME

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

G-at_pp-en_a_sc



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