



# SCUBA DRY Series

CLOSE-COUPLED SURFACE AND SUBMERSIBLE ELECTRIC PUMPS

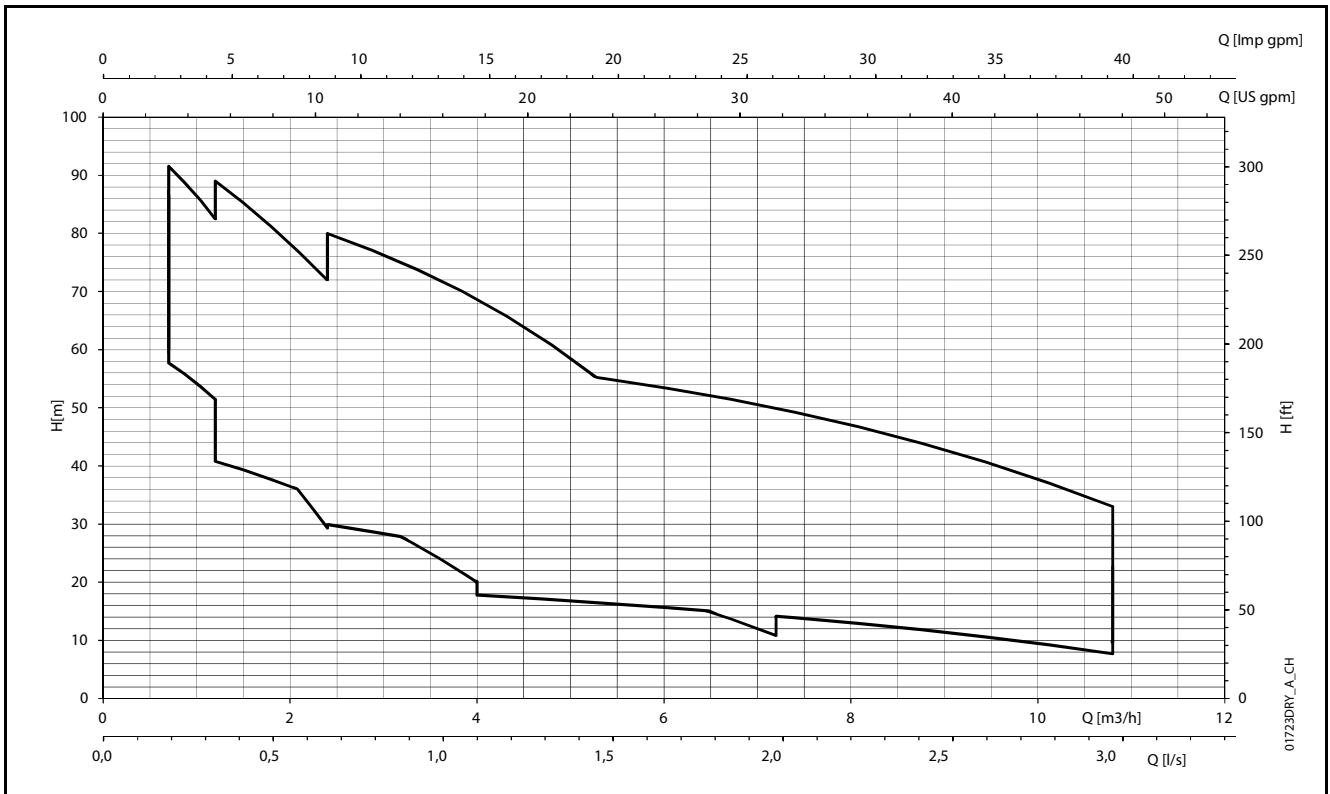
**ErP 2009/125/EC**



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**SCUBA DRY SERIES  
HYDRAULIC PERFORMANCE RANGE**



## Multistage electric pump SCUBA DRY series

### GENERAL INTRODUCTION



- **Head made of microcasted stainless steel**
- **Plug-in power supply cable and float switch**
- **Potable water version**
- **Noiseless operation**
- **Sand abrasion resistant impellers**

### MARKET SECTORS

RESIDENTIAL BUILDINGS, INDUSTRY.

### APPLICATIONS

- Rain water harvesting.
- Water supply from primary water supply tanks or reservoirs.
- Pressure boosting with pump directly inserted in tank or well.
- Car washing system.
- Onboard ships pressure boosting
- Air purification/humidification systems
- Sprinkler irrigation systems.
- Specific for:
  - Narrow or poorly aerated spaces.
  - Basements subject to flooding risk.
  - Applications which require silent functioning.

### CHARACTERISTIC DATA

- **Delivery:** up to 10,8 m<sup>3</sup>/h at 2850 rpm.
- **Head:** up to 100 m at 2850 rpm.
- **Motor power:** 0,55 to 2,2 kW.
- **Maximum operating pressure:** 10 bar.
- **Single-phase version:** 220-240 V, 50 Hz 2 poles (2850 rpm).
- With built-in automatic reset overload protection.
- Standard version with built-in capacitor, or external capacitor upon request
- **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).

### OPERATING CONDITIONS

- **Temperature of pumped liquid:**
  - Standard version: 0 to 40°C.
  - Potable water version: 0 to 40°C.
- Vertical/Horizontal installation
- **Maximum immersion depth:** 17 m
- **Maximum operating pressure:** 10 PN
- **Maximum permissible quantity of suspended sand:** 25 g/m<sup>3</sup>
- **Maximum quantity of chloride** at 20°C: 200 PPM
- **Max solid dimension** up to:
  - 1SCD(S): 1 mm
  - 3SCD(S), 5SCD(S), 8SCD(S): 2mm

### CONSTRUCTION CHARACTERISTICS

- The liquid end is located underneath the electric motor, which is cooled by the pumped liquid.
- Impellers are radial centrifugal type, made of technopolymer.
- Diffusers, outer sleeve, motor casing, suction screen and shaft extension are made of stainless steel.
- Head is made of microcasted stainless steel.
- Floor base specific for rainwater harvesting tanks or surface installations.
- Ease of installation and maintenance due to plug-in power supply cable and float switch
- Potable water version available upon request.
- The electric motor is protected by a double seal system with an oil chamber.

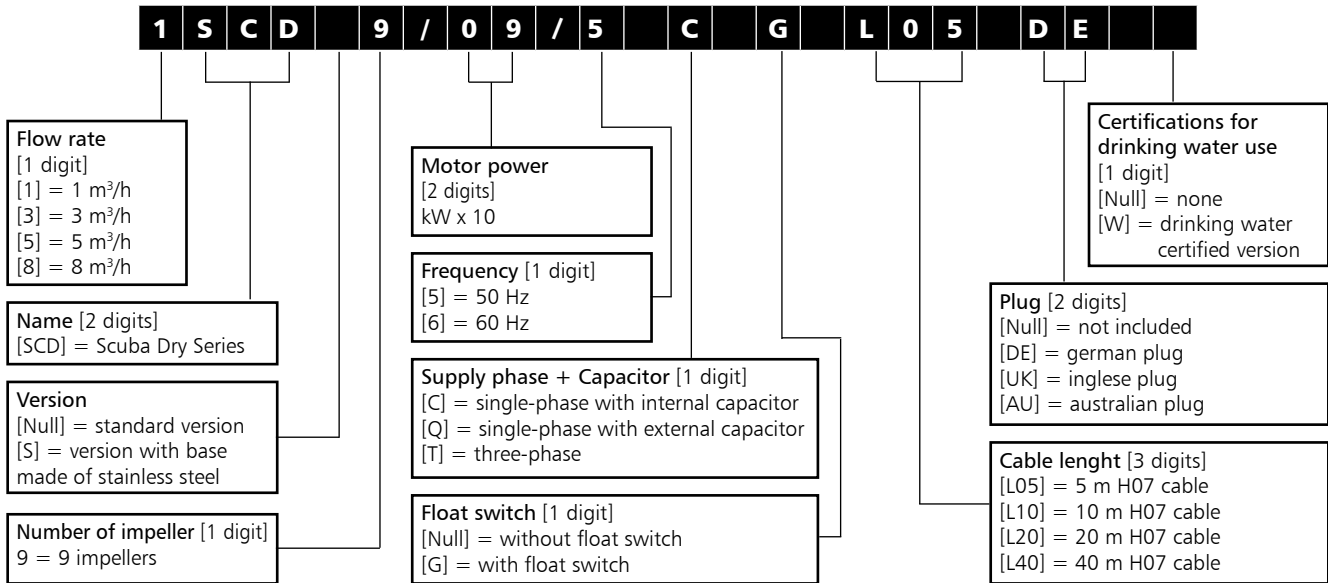
### ACCESSORIES

- Kit with floating suction device
- Kit with floating switch
- Control panel with external capacitor
- Control and protection panel

Upon request:

- Installation with float
- Kit with ResiBoost inverter
- 220 - 230V, three-phase version
- Power supply cord available in multiple length
- Potable water certified version available
- Wide range of flanges

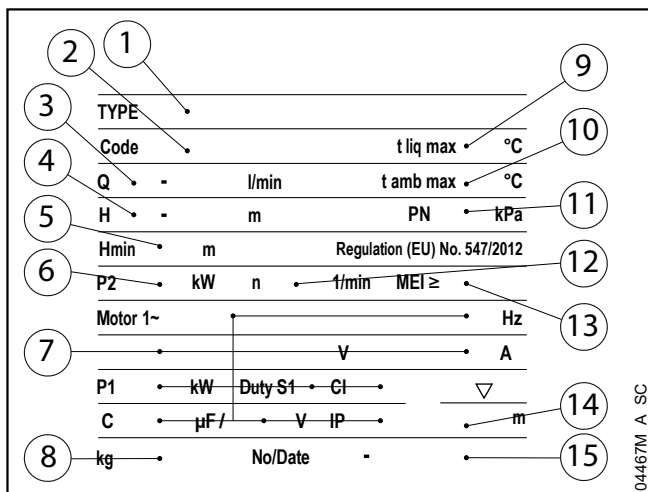
## SCUBA DRY SERIES IDENTIFICATION CODE



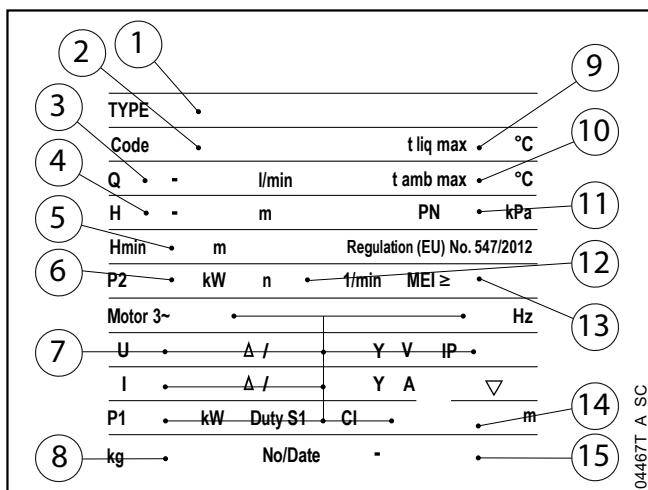
### EXAMPLE: 1SCD9/09/5 C G L05 DE

Flow rate 1 m<sup>3</sup>/h, Scuba Dry series electric pump, standard version, 9 impellers, motor power 0,9 kW, frequency 50 Hz, single-phase version with internal capacitor, with float switch, 5 m of H07 cable and german plug.

## RATING PLATE - SINGLE-PHASE



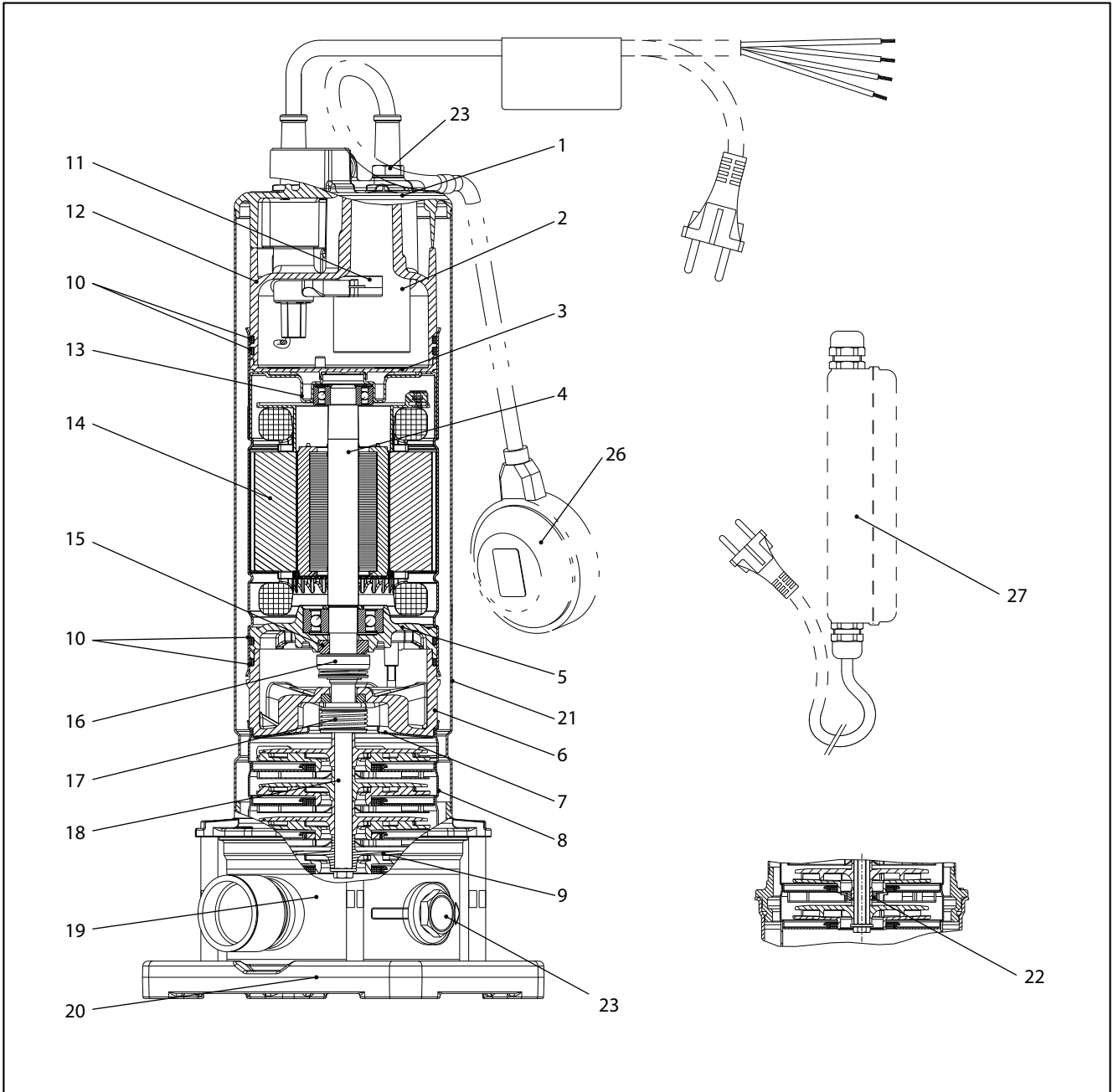
## RATING PLATE - THREE-PHASE



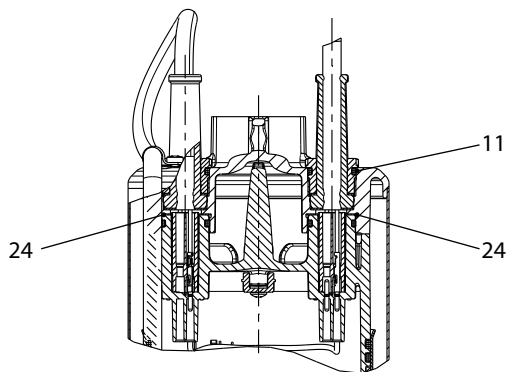
## LEGEND

- 1 - Electric pump type
- 2 - Code
- 3 - Delivery range
- 4 - Head range
- 5 - Minimum head
- 6 - Motor nominal power
- 7 - Motor characteristics:
  - Motor type
  - Frequency
  - Supply voltage
  - Absorbed current
  - Absorbed power
  - Type of service S1
  - Thermal class
  - Capacità del condensatore (single-phase version)
  - Capacitor voltage (single-phase version)
  - Protection class
- 8 - Weight
- 9 - Maximum operating liquid temperature
- 10 - Maximum operating ambient temperature
- 11 - Maximum operating pressure
- 12 - Speed
- 13 - Minimum efficiency index MEI
- 14 - Maximum immersion depth
- 15 - Serial number and manufacturing data

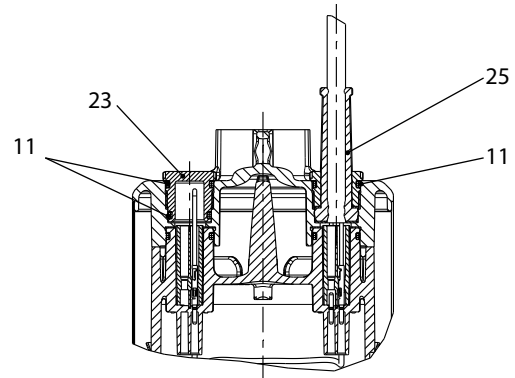
**SCUBA DRY SERIES  
PUMP SECTION AND LIST OF MAIN COMPONENTS**



**VERSION WITH FLOAT SWITCH**



**VERSION WITHOUT FLOAT SWITCH**



04453BD\_A\_DS

## SCUBA DRY SERIES TABLE OF MATERIALS

N°	DENOMINATION	MATERIAL	REFERENCE STANDARD	
			EUROPE	USA
1	Head	Stainless steel	EN 10088-1-GX5CrNi19-10 (1.4308)	ASTM A743 CF8
2	Capacitor			
3	Connection container	PA66-GF25		
4	Motor shaft	Stainless steel	EN 10088-3-X17CrNi16-2 (1.4057)	AISI 431
5	Lower bearing support	Die-cast aluminium		
6	Lower head	Technopolymer		
7	Final bowl	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
8	Diffuser	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
9	Impeller	Technopolymer		
10	Elastomers	Nitrile rubber (NBR)		
11	Capacitor housing spacer	PA66-GF25		
12	Upper head	Technopolymer		
13	Upper bearing support	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
14	Sleeve with wound stator	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
15	Internal mech. seal (rotary part)	Carbographite		
16	Internal mech. seal (fixed part)	Steatite		
17	External mech. seal	Silicon carbide / Silicon carbide / NBR		
18	Pump shaft	Stainless steel	EN 10088-3-X17CrNi16-2 (1.4057)	AISI 431
19	Pump body	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
20	Base (SCD version)	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	
	Base (SCDS version)	Stainless steel	EN 10088-1-GX5CrNi19-10 (1.4308)	ASTM A743 CF8
21	Sleeve	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
22	Bush bearing (*)	Technopolymer		
23	Plug	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
24	Plate gasket	EPDM		
25	Cable guide	Nitrile rubber (NBR)		
26	Float switch (**)			
27	QC (***)			

(\*) Bush bearing version for models 1SC, 3SC, 5SC from 6 to 9 stages; 8SC from 5 to 6 stages.

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(\*\*) for G version only.

(\*\*\*) for single-phase without capacitor only.



## SCUBA DRY SERIES PUMP

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

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

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

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

The Regulation also establishes the following deadlines:

from	minimum efficiency index (MEI)
1st January 2015	MEI ≥ 0,4

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

- 1) Minimum efficiency index: see the MEI column in the following pages.
- 2) “The benchmark for most efficient water pumps is MEI ≥ 0,70”.
- 3) Year of manufacture: from January 2020.
- 4) Manufacturer: Xylem Service Italia srl - Reg. No. 07520560967 - Montecchio Maggiore, Vicenza, Italia.
- 5) Product type: see the PUMP TYPE column in the tables in the *Hydraulic performance* section.
- 6) Hydraulic pump efficiency with trimmed impeller: not applicable to these products.
- 7) Pump performance curves, including the performance curve: see the *Operating Characteristics* graphs in the following pages.
- 8) “The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter”.
- 9) “The operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system”.
- 10) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
- 11) “Designed for use below – 10 °C only”: note not applicable to these products.
- 12) “Designed for use above 120 °C only”: note not applicable to these products.
- 13) Specific instructions for pumps as per points 11 and 12: not applicable to these products.
- 14) “Information on benchmark efficiency is available at”: [www.europump.org](http://www.europump.org) (Ecodesign section).
- 15) The benchmark efficiency graphs with MEI = 0.7 and MEI = 0.4 are available at [www.europump.org/efficiencycharts](http://www.europump.org/efficiencycharts) or <http://europump.net/uploads/Fingerprints.pdf> (refer to “Multistage Vertical 2900 rpm”).

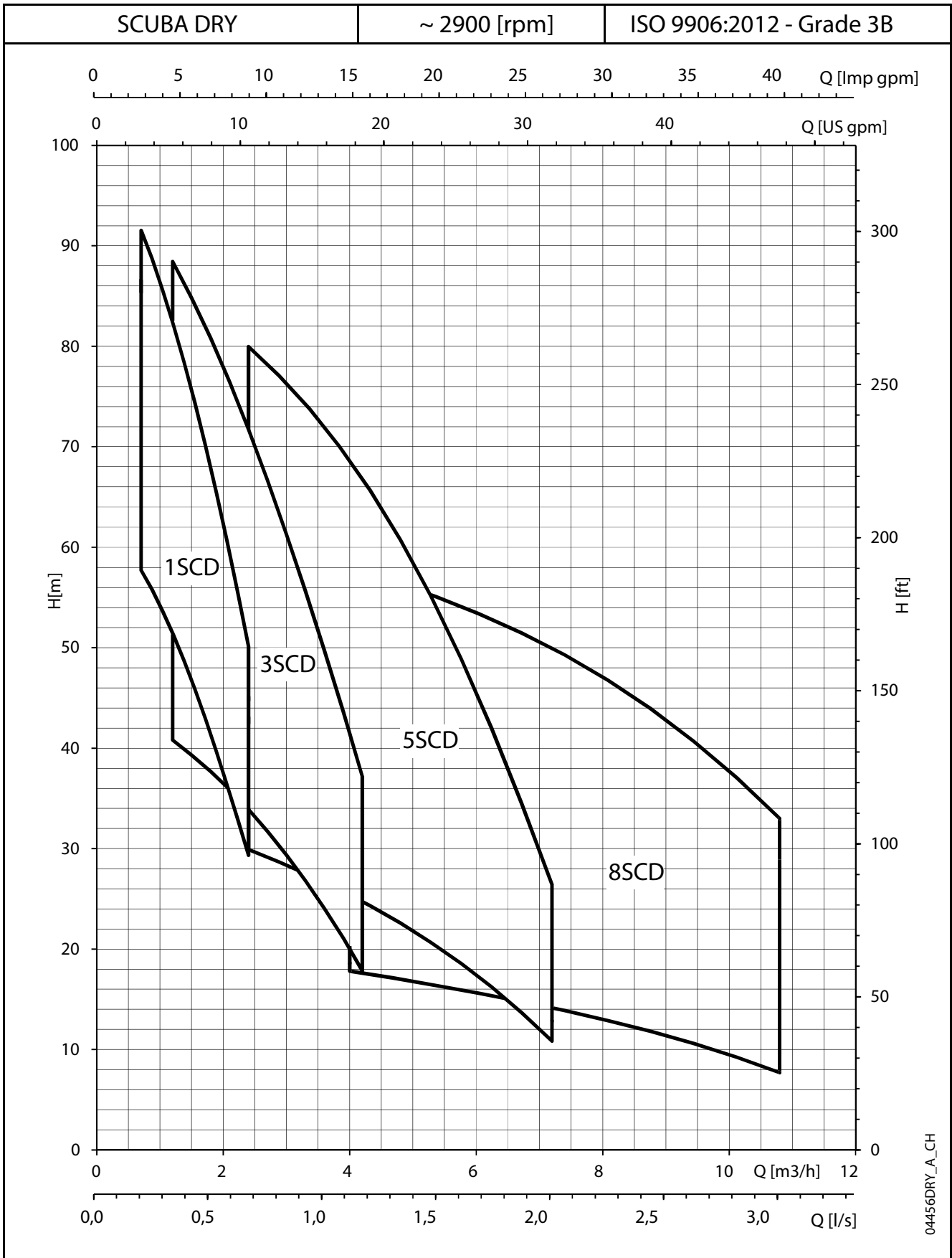
## SCUBA DRY SERIES MINIMUM EFFICIENCY INDEX (MEI)

STANDARD VERSION	
PUMP SIZE	MEI
1SCD6/..	≥0,70
1SCD7/..	≥0,70
1SCD9/..	≥0,70
3SCD4/..	≥0,70
3SCD5/..	≥0,70
3SCD7/..	≥0,70
3SCD8/..	≥0,70
3SCD9/..	≥0,70
5SCD3/..	≥0,70
5SCD4/..	≥0,70
5SCD5/..	≥0,70
5SCD6/..	≥0,70
5SCD7/..	≥0,70
5SCD8/..	≥0,70
8SCD2/..	0,60
8SCD3/..	0,60
8SCD4/..	0,60
8SCD5/..	0,60
8SCD6/..	0,60

SUBMERSIBLE VERSION	
GRANDEZZA	MEI
1SCDS6/..	≥0,70
1SCDS7/..	≥0,70
1SCDS9/..	≥0,70
3SCDS4/..	≥0,70
3SCDS5/..	≥0,70
3SCDS7/..	≥0,70
3SCDS8/..	≥0,70
3SCDS9/..	≥0,70
5SCDS3/..	≥0,70
5SCDS4/..	≥0,70
5SCDS5/..	≥0,70
5SCDS6/..	≥0,70
5SCDS7/..	≥0,70
5SCDS8/..	≥0,70
8SCDS2/..	0,60
8SCDS3/..	0,60
8SCDS4/..	0,60
8SCDS5/..	0,60
8SCDS6/..	0,60

SCUBA-MEI-en\_a\_sc

### SCUBA DRY SERIES HYDRAULIC PERFORMANCE RANGE



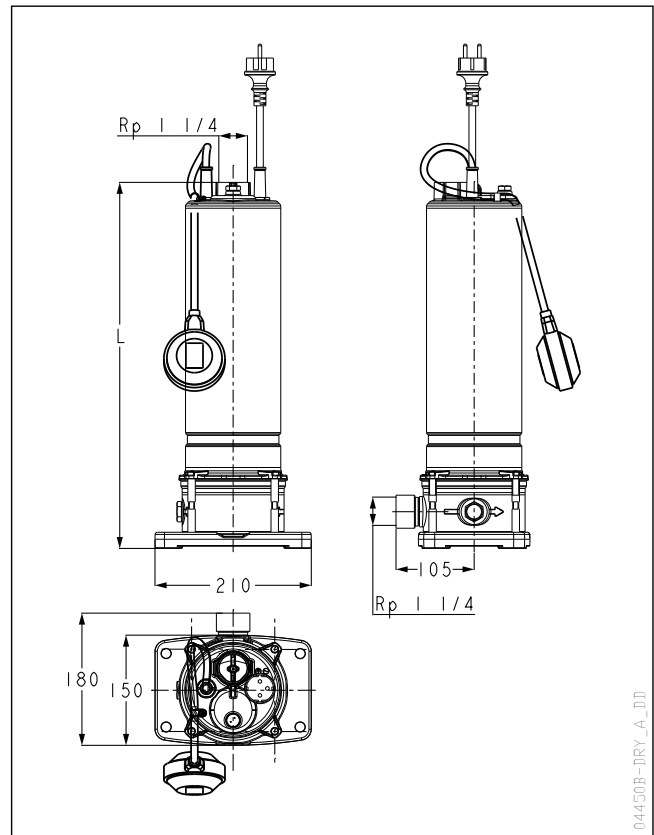
## 1SCD, 1SCDS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	N. OF STAGE	DIMENSIONS L [mm]	WEIGHT [kg]	
			STANDARD VERSION	SUBMERSIBLE VERSION
1SCD..6/05/5..	6	538	14,5	17,6
1SCD..7/07/5..	7	578	16,5	20,0
1SCD..9/09/5..	9	618	17,5	21,1
1SCD..6/05/5T	6	538	14,5	18,0
1SCD..7/07/5T	7	578	17,4	20,5
1SCD..9/09/5T	9	618	18,4	21,6

PUMP TYPE	SECTION	CABLE TYPE	CABLE LENGHT [m]	
			STANDARD VERSION	SUBMERSIBLE VERSION
1SCD..6/05/5..	3G1	H07RN-F	5	20
1SCD..7/07/5..	3G1,5	H07RN-F	5	20
1SCD..9/09/5..	3G1,5	H07RN-F	5	20
1SCD..6/05/5T	4G1	H07RN-F	5	20
1SCD..7/07/5T	4G1,5	H07RN-F	5	20
1SCD..9/09/5T	4G1,5	H07RN-F	5	20

Versions with 10 meter cable available on request

1SCD-2p50-en\_a\_td



04450B-DRY\_A\_DD

## HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	RATED POWER		Q = DELIVERY									
			l/min	11,7	15,0	18,3	21,7	25,0	28,3	31,7	35,0	40,0
			0	0,7	0,9	1,1	1,3	1,5	1,7	1,9	2,1	2,4
	kW	HP	H = TOTAL HEAD METRES COLUMN OF WATER									
1SCD..6/05/5..	0,55	0,75	64,0	57,7	55,5	52,9	50,0	46,8	43,3	39,5	35,5	29,3
1SCD..7/07/5..	0,75	1	76,9	70,1	67,5	64,7	61,4	57,9	54,0	49,8	45,3	38,1
1SCD..9/09/5..	0,9	1,2	97,3	88,2	84,5	80,5	76,0	71,2	66,0	60,4	54,6	45,4
1SCD..6/05/5T	0,55	0,75	65,7	59,6	57,4	54,9	52,1	49,0	45,7	42,0	38,0	31,7
1SCD..7/07/5T	0,75	1	78,9	72,2	69,7	66,9	63,7	60,2	56,3	52,1	47,7	40,5
1SCD..9/09/5T	0,9	1,2	99,5	91,6	88,2	84,5	80,3	75,6	70,6	65,2	59,4	50,1

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

1SCD-2p50-en\_a\_th

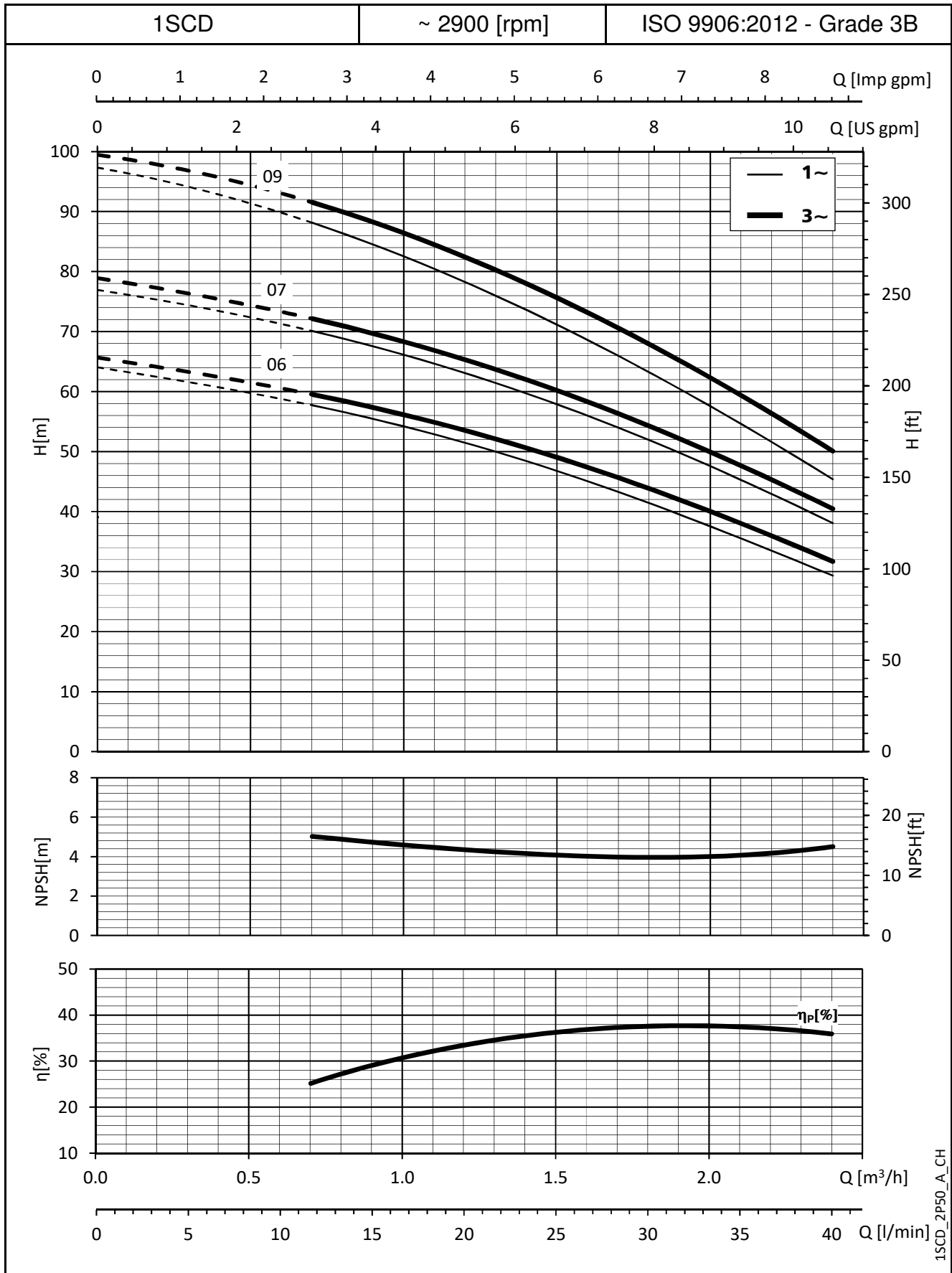
## PUMP - CONTROL PANEL COMBINATION TABLE

PUMP TYPE	ABSORBED POWER* (P1 MAX)	ABSORBED CURRENT* 220-240 V	ABSORBED CURRENT* 380-415 V	CAPACITOR μF / 450 V	TYPE	QC		ELECTRIC PUMP WEIGHT kg	PANEL TYPE 380-415 V	
						CABLE SECTION	POWER SIDE		QTD	Q3D
1SCD..6/05/5..	0,91	4,17	-	16	0,55	4G1,5	3G1,5	15,1	-	-
1SCD..7/07/5..	1,13	4,94	-	25	0,90	4G1,5	3G1,5	17,6	-	-
1SCD..9/09/5..	1,24	5,53	-	25	0,90	4G1,5	3G1,5	18,2	-	-
1SCD..6/05/5T	0,85	2,81	1,57	-	-	-	-	-	05-07	05-07
1SCD..7/07/5T	1,00	4,21	2,15	-	-	-	-	-	07-15	07-15
1SCD..9/09/5T	1,25	4,38	2,38	-	-	-	-	-	07-15	07-15

\* Maximum values within operating range

1SCD-2p50-en\_a\_tp

### 1SCD, 1SCDS SERIES OPERATING CHARACTERISTICS



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

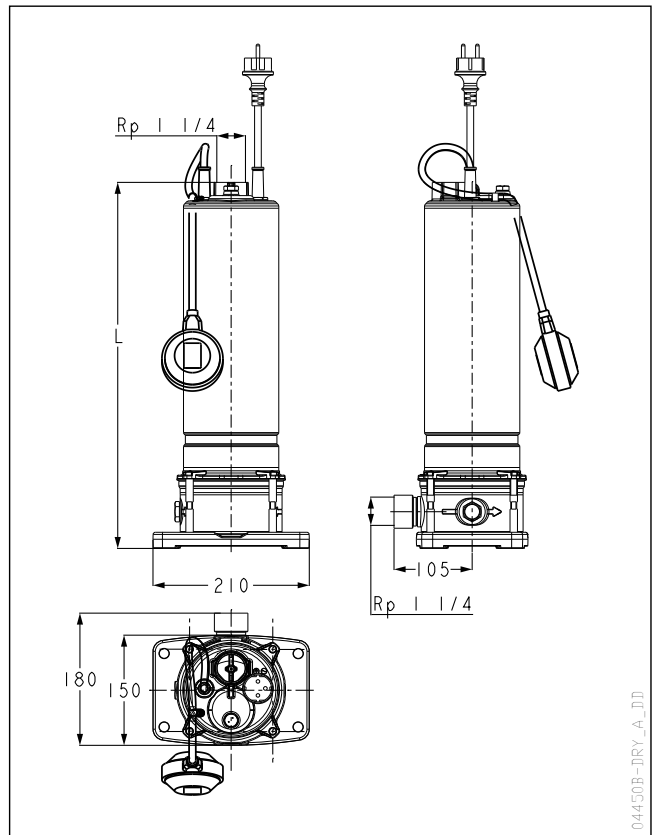
## 3SCD, 3SCDS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	N. OF STAGE	DIMENSIONS L [mm]	WEIGHT [kg]	
			STANDARD VERSION	SUBMERSIBLE VERSION
3SCD..4/05/5..	4	498	14,1	17,1
3SCD..5/07/5..	5	538	16,3	19,7
3SCD..7/09/5..	7	578	16,5	20,0
3SCD..8/11/5..	8	618	18,1	20,5
3SCD..9/15/5..	9	668	20,8	24,4
3SCD..4/05/5T	4	498	14,0	17,5
3SCD..5/07/5T	5	538	17,0	20,0
3SCD..7/09/5T	7	578	17,4	20,5
3SCD..8/15/5T	8	628	19,2	22,3
3SCD..9/22/5T	9	668	20,7	24,0

PUMP TYPE	SECTION	CABLE TYPE	CABLE LENGHT [m]	
			STANDARD VERSION	SUBMERSIBLE VERSION
3SCD..4/05/5..	3G1	H07RN-F	5	20
3SCD..5/07/5..	3G1,5	H07RN-F	5	20
3SCD..7/09/5..	3G1,5	H07RN-F	5	20
3SCD..8/11/5..	3G1,5	H07RN-F	5	20
3SCD..9/15/5..	3G1,5	H07RN-F	5	20
3SCD..4/05/5T	4G1	H07RN-F	5	20
3SCD..5/07/5T	4G1,5	H07RN-F	5	20
3SCD..7/09/5T	4G1,5	H07RN-F	5	20
3SCD..8/15/5T	4G1,5	H07RN-F	5	20
3SCD..9/22/5T	4G1,5	H07RN-F	5	20

Versions with 10 meter cable available on request

3SCD-2p50-en\_a\_td



04450B-DRY\_A\_DD

## HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	RATED POWER		Q = DELIVERY									
			l/min	20,0	26,7	33,3	40,0	46,7	53,3	60,0	66,7	70,0
			0	1,2	1,6	2,0	2,4	2,8	3,2	3,6	4,0	4,2
			H = TOTAL HEAD METRES COLUMN OF WATER									
3SCD..4/05/5..	0,55	0,75	45,4	40,8	38,8	36,5	33,9	31,0	27,7	24,0	20,0	17,8
3SCD..5/07/5..	0,75	1	56,2	51,1	48,5	45,5	42,2	38,4	34,2	29,6	24,7	22,0
3SCD..7/09/5..	0,9	1,2	77,2	68,6	64,6	60,1	55,1	49,6	43,8	37,5	30,9	27,4
3SCD..8/11/5..	1,1	1,5	86,1	75,6	71,5	66,9	61,7	55,9	49,4	42,1	33,8	29,3
3SCD..9/15/5..	1,5	2	98,4	88,4	83,6	78,0	71,7	64,9	57,6	49,7	41,5	37,2
3SCD..4/05/5T	0,55	0,75	46,5	42,6	40,7	38,6	36,1	33,2	30,0	26,5	22,6	20,4
3SCD..5/07/5T	0,75	1	57,5	52,2	49,7	46,9	43,7	40,1	36,1	31,6	26,7	24,1
3SCD..7/09/5T	0,9	1,2	78,1	70,3	66,8	62,8	58,3	53,1	47,3	40,8	33,6	29,7
3SCD..8/15/5T	1,5	2	89,1	79,6	75,7	71,2	66,1	60,2	53,5	45,8	37,1	32,3
3SCD..9/22/5T	2,2	3	99,7	89,0	83,9	78,2	71,9	65,1	57,7	49,9	41,7	37,5

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

3SCD-2p50-en\_a\_th

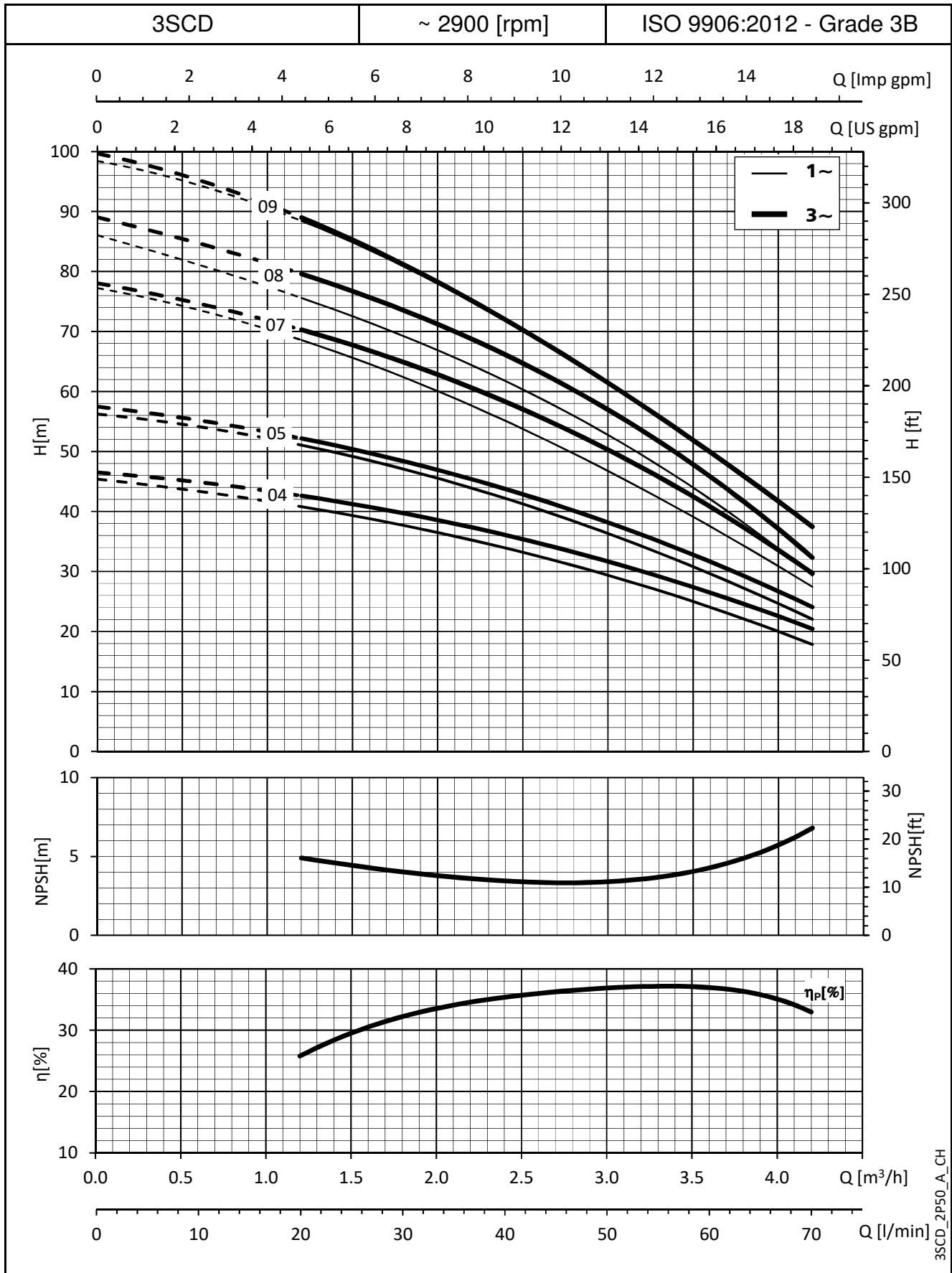
## PUMP - CONTROL PANEL COMBINATION TABLE

PUMP TYPE	ABSORBED POWER* (P1 MAX) kW	ABSORBED CURRENT* 220-240 V A	ABSORBED CURRENT* 380-415 V A	CAPACITOR μF / 450 V	QC		ELECTRIC PUMP WEIGHT kg	PANEL TYPE 380-415 V			
					TYPE	CABLE SECTION		MOTOR SIDE	POWER SIDE	QTD/..	Q3D/..
3SCD..4/05/5..	0,85	4,06	-	16	0,55	4G1,5	3G1,5	14,5	-	-	
3SCD..5/07/5..	1,05	4,80	-	25	0,9	4G1,5	3G1,5	17,0	-	-	
3SCD..7/09/5..	1,31	5,88	-	25	0,9	4G1,5	3G1,5	17,7	-	-	
3SCD..8/11/5..	1,55	6,85	-	30	1,1	4G1,5	3G1,5	19,3	-	-	
3SCD..9/15/5..	1,79	7,94	-	40	1,5	4G1,5	3G1,5	21,9	-	-	
3SCD..4/05/5T	0,79	2,68	1,55	-	-	-	-	-	03-05	03-05	
3SCD..5/07/5T	1,00	3,98	2,30	-	-	-	-	-	05-07	05-07	
3SCD..7/09/5T	1,31	4,47	2,58	-	-	-	-	-	07-15	07-15	
3SCD..8/15/5T	1,49	5,84	3,37	-	-	-	-	-	07-15	07-15	
3SCD..9/22/5T	1,65	6,37	3,68	-	-	-	-	-	07-15	07-15	

\* Maximum values within operating range

3SCD-2p50-en\_a\_th

### 3SCD, 3SCDS SERIES OPERATING CHARACTERISTICS



3SCD\_2P50\_A\_CH

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

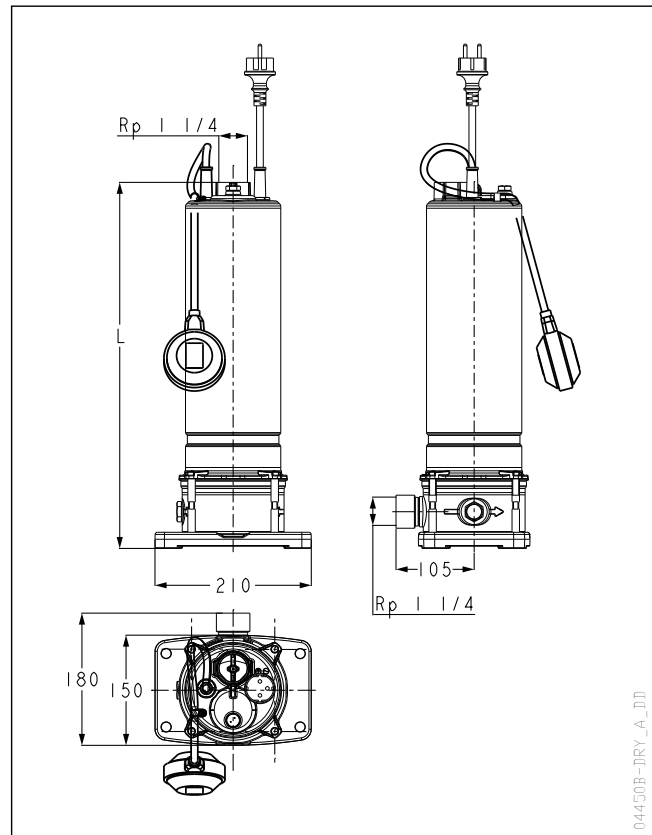
## 5SCD, 5SCDS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	N. OF STAGE	DIMENSIONS L [mm]	WEIGHT [kg]	
			STANDARD VERSION	SUBMERSIBLE VERSION
5SCD..3/05/5..	3	478	13,6	16,7
5SCD..4/07/5..	4	518	15,6	19,1
5SCD..5/09/5..	5	538	15,8	19,4
5SCD..6/11/5..	6	578	17,7	21,3
5SCD..8/15/5..	8	648	20,4	23,9
5SCD..3/05/5T	3	478	13,6	17,1
5SCD..4/07/5T	4	518	16,5	19,6
5SCD..5/09/5T	5	538	16,7	19,9
5SCD..6/11/5T	6	578	18,6	21,8
5SCD..7/15/5T	7	608	19,8	22,9
5SCD..8/22/5T	8	648	21,3	24,4

PUMP TYPE	SECTION	CABLE TYPE	CABLE LENGTH [m]	
			STANDARD VERSION	SUBMERSIBLE VERSION
5SCD..3/05/5..	3G1	H07RN-F	5	20
5SCD..4/07/5..	3G1,5	H07RN-F	5	20
5SCD..5/09/5..	3G1,5	H07RN-F	5	20
5SCD..6/11/5..	3G1,5	H07RN-F	5	20
5SCD..8/15/5..	3G1,5	H07RN-F	5	20
5SCD..3/05/5T	4G1	H07RN-F	5	20
5SCD..4/07/5T	4G1,5	H07RN-F	5	20
5SCD..5/09/5T	4G1,5	H07RN-F	5	20
5SCD..6/11/5T	4G1,5	H07RN-F	5	20
5SCD..7/15/5T	4G1,5	H07RN-F	5	20
5SCD..8/22/5T	4G1,5	H07RN-F	5	20

Versions with 10 meter cable available on request

5SCD-2p50-en\_a\_td



04450B-DRY\_A\_DD

## HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	RATED POWER		Q = DELIVERY									
			l/min 0	40	50	60	70	80	90	100	110	120
			m <sup>3</sup> /h 0	2,4	3,0	3,6	4,2	4,8	5,4	6,0	6,6	7,2
			H = TOTAL HEAD METRES COLUMN OF WATER									
5SCD..3/05/5..	0,55	0,75	35,1	29,9	28,4	26,7	24,7	22,6	20,2	17,4	14,3	10,8
5SCD..4/07/5..	0,75	1	46,3	39,4	37,4	35,2	32,6	29,7	26,3	22,4	18,1	13,3
5SCD..5/09/5..	0,9	1,2	58,2	48,9	46,4	43,5	40,3	36,7	32,5	27,8	22,4	16,4
5SCD..6/11/5..	1,1	1,5	69,1	58,3	55,2	51,8	47,8	43,3	38,2	32,4	25,8	18,6
5SCD..8/15/5..	1,5	2	91,9	77,0	73,0	68,5	63,2	57,0	50,0	41,9	33,0	23,2
5SCD..3/05/5T	0,55	0,75	35,5	30,4	28,9	27,2	25,4	23,3	20,9	18,2	15,1	11,5
5SCD..4/07/5T	0,75	1	47,5	41,4	39,6	37,5	35,2	32,4	29,2	25,4	21,2	16,3
5SCD..5/09/5T	0,9	1,2	59,9	51,5	49,0	46,2	43,1	39,5	35,4	30,7	25,3	19,0
5SCD..6/11/5T	1,1	1,5	69,0	58,8	56,0	52,6	48,8	44,2	39,0	33,1	26,4	19,1
5SCD..7/15/5T	1,5	2	81,5	70,9	67,7	63,8	59,2	53,8	47,6	40,5	32,6	24,1
5SCD..8/22/5T	2,2	3	93,5	80,0	76,3	72,0	66,8	60,8	53,7	45,6	36,4	26,4

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

5SCD-2p50-en\_a\_th

## PUMP - CONTROL PANEL COMBINATION TABLE

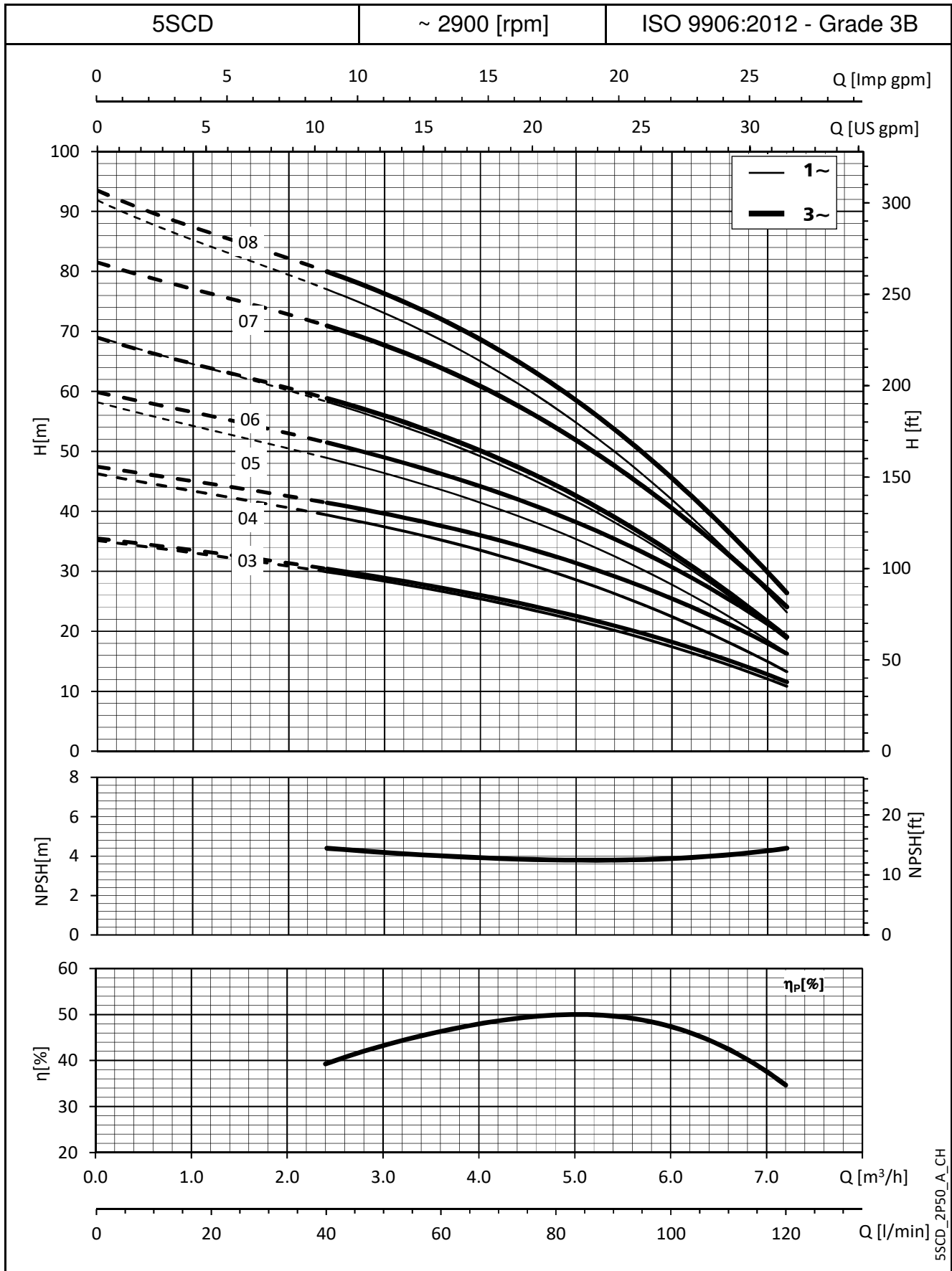
PUMP TYPE	ABSORBED POWER* (P1 MAX) kW	ABSORBED CURRENT* 220-240 V A	ABSORBED CURRENT* 380-415 V A	CAPACITOR μF / 450 V	QC CABLE SECTION			ELECTRIC PUMP WEIGHT kg	PANEL TYPE 380-415 V	
					TYPE	MOTOR SIDE	POWER SIDE		QTD	Q3D
5SCD..3/05/5..	0,86	4,08	-	16	0,55	4G1,5	3G1,5	14,2	-	-
5SCD..4/07/5..	1,10	4,98	-	25	0,9	4G1,5	3G1,5	16,7	-	-
5SCD..5/09/5..	1,28	5,72	-	25	0,9	4G1,5	3G1,5	17,0	-	-
5SCD..6/11/5..	1,56	6,90	-	30	1,1	4G1,5	3G1,5	18,7	-	-
5SCD..8/15/5..	2,04	9,00	-	40	1,5	4G1,5	3G1,5	21,6	-	-
5SCD..3/05/5T	0,80	2,70	1,56	-	-	-	-	-	03-05	03-05
5SCD..4/07/5T	1,06	4,07	2,35	-	-	-	-	-	05-07	05-07
5SCD..5/09/5T	1,27	4,40	2,54	-	-	-	-	-	07-15	07-15
5SCD..6/11/5T	1,48	4,71	2,72	-	-	-	-	-	07-15	07-15
5SCD..7/15/5T	1,72	6,18	3,57	-	-	-	-	-	07-15	07-15
5SCD..8/22/5T	1,92	6,81	3,93	-	-	-	-	-	07-15	07-15

\* Maximum values within operating range

5SCD-2p50-en\_a\_th



### 5SCD, 5SCDS SERIES OPERATING CHARACTERISTICS



5SCD\_2P50\_A\_CH

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

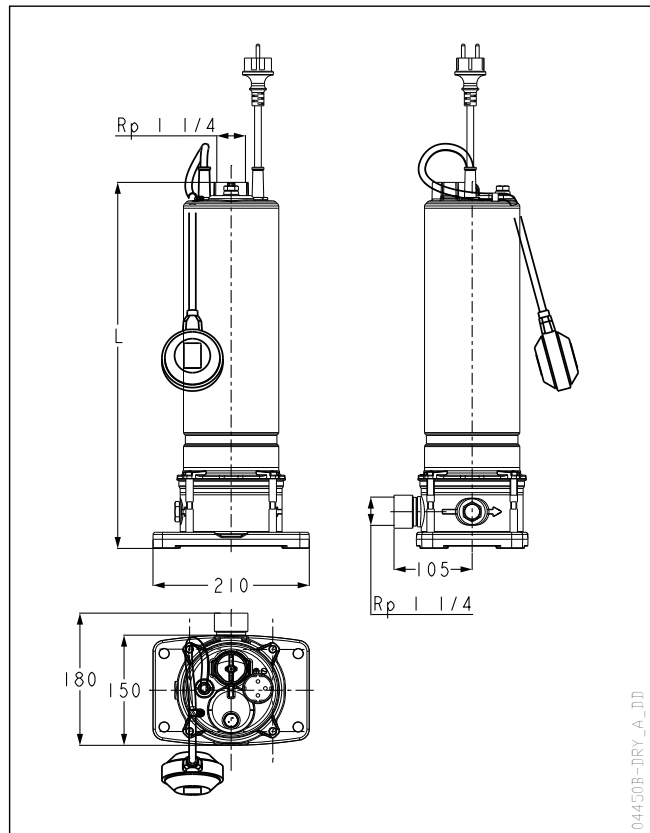
## 8SCD, 8SCDS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	N. OF STAGE	DIMENSIONS L [mm]	WEIGHT [kg]	
			STANDARD VERSION	SUBMERSIBLE VERSION
8SCD..2/05/5..	2	468	13,3	16,4
8SCD..3/09/5..	3	513	15,4	19,0
8SCD..6/15/5..	6	638	20,1	23,6
8SCD..2/05/5T	2	468	13,4	16,9
8SCD..3/09/5T	3	513	16,3	19,5
8SCD..4/11/5T	4	558	18,1	21,2
8SCD..5/15/5T	5	618	19,2	22,3
8SCD..6/22/5T	6	638	20,9	24,0

PUMP TYPE	SECTION	CABLE TYPE	CABLE LENGTH [m]	
			STANDARD VERSION	SUBMERSIBLE VERSION
8SCD..2/05/5..	3G1	H07RN-F	5	20
8SCD..3/09/5..	3G1,5	H07RN-F	5	20
8SCD..6/15/5..	3G1,5	H07RN-F	5	20
8SCD..2/05/5T	4G1	H07RN-F	5	20
8SCD..3/09/5T	4G1,5	H07RN-F	5	20
8SCD..4/11/5T	4G1,5	H07RN-F	5	20
8SCD..5/15/5T	4G1,5	H07RN-F	5	20
8SCD..6/22/5T	4G1,5	H07RN-F	5	20

Versions with 10 meter cable available on request

8SCD-2p50-en\_a\_td



04450B-DRY\_A\_DD

## HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	RATED POWER		Q = DELIVERY											
			l/min	66,7	81,7	96,7	112	127	142	157	172	180		
			0	4,0	4,9	5,8	6,7	7,6	8,5	9,4	10,3	10,8		
		H = TOTAL HEAD METRES COLUMN OF WATER												
	kW	HP	m <sup>3</sup> /h											
8SCD..2/05/5..	0,55	0,75	21,1	17,9	17,0	16,1	15,2	14,1	12,9	11,5	9,8	8,8		
8SCD..3/09/5..	0,9	1,2	32,0	27,8	26,7	25,4	24,0	22,3	20,5	18,3	15,8	14,2		
8SCD..6/15/5..	1,5	2	64,5	56,1	53,7	51,1	48,2	45,0	41,2	36,9	31,8	28,6		
8SCD..2/05/5T	0,55	0,75	21,4	18,5	17,7	16,8	15,8	14,7	13,6	12,2	10,6	9,6		
8SCD..3/09/5T	0,9	1,2	32,6	28,7	27,6	26,4	25,1	23,7	22,0	20,0	17,6	16,0		
8SCD..4/11/5T	1,1	1,5	43,4	38,3	36,9	35,4	33,7	31,7	29,3	26,6	23,3	21,2		
8SCD..5/15/5T	1,5	2	55,0	48,6	46,8	44,9	42,5	39,8	36,5	32,6	27,8	24,8		
8SCD..6/22/5T	2,2	3	65,1	57,9	56,1	54,0	51,5	48,6	45,1	40,9	36,0	33,0		

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

8SCD-2p50-en\_a\_th

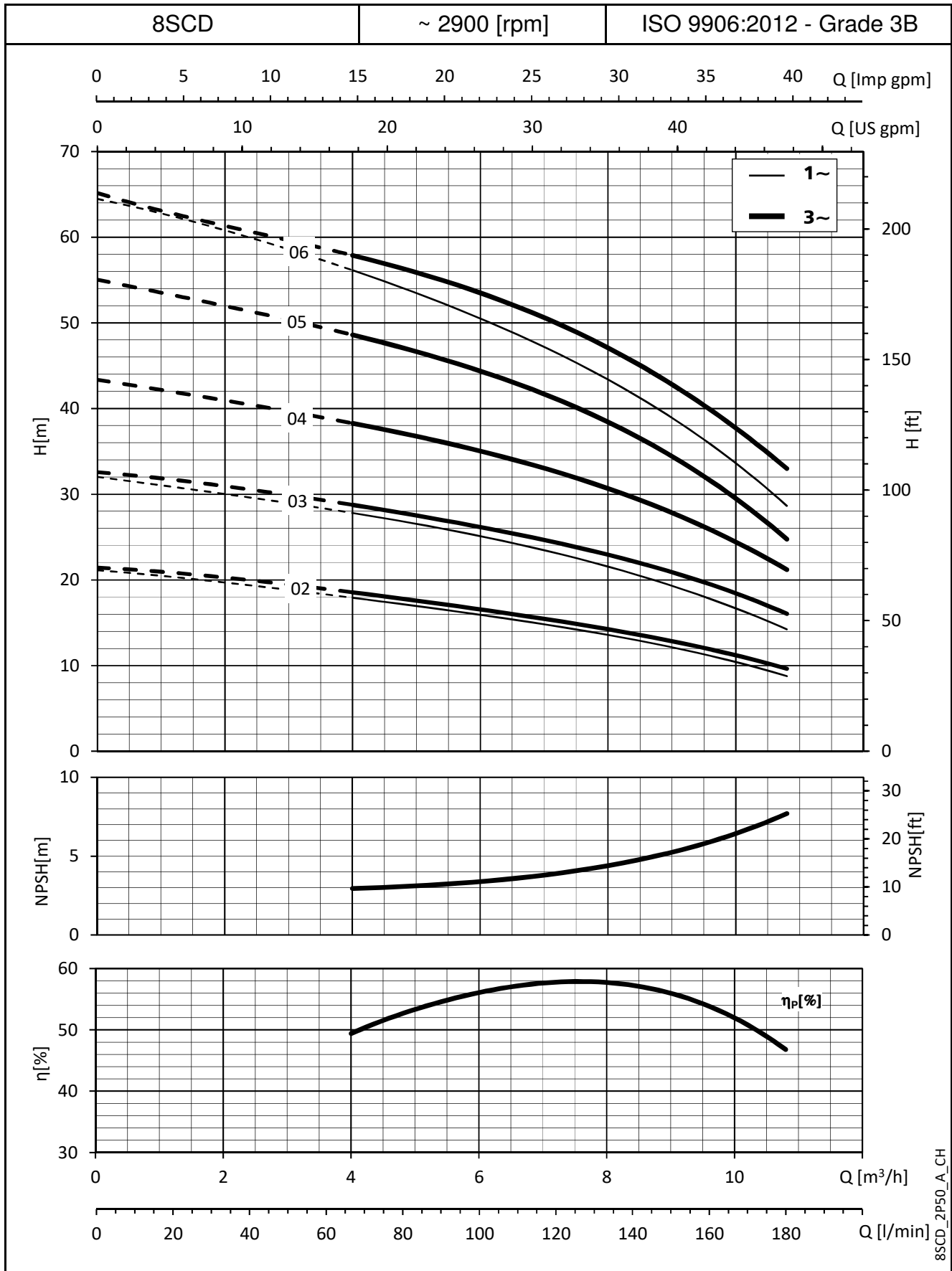
## PUMP - CONTROL PANEL COMBINATION TABLE

PUMP TYPE	ABSORBED POWER* (P1 MAX)	ABSORBED CURRENT* 220-240 V	ABSORBED CURRENT* 380-415 V	CAPACITOR	QC		ELECTRIC PUMP WEIGHT	PANEL TYPE 380-415 V		
					TYPE	CABLE SECTION		kg	QTD	Q3D
	kW	A	A	μF / 450 V						
8SCD..2/05/5..	0,91	4,25	-	16,00	0,55	4G1,5	3G1,5	14,0	-	-
8SCD..3/09/5..	1,26	5,66	-	25,00	0,90	4G1,5	3G1,5	19,2	-	-
8SCD..6/15/5..	2,35	10,36	-	40,00	1,50	4G1,5	3G1,5	20,6	-	-
8SCD..2/05/5T	0,86	2,81	1,62	-	-	-	-	-	05-07	05-07
8SCD..3/09/5T	1,25	4,38	2,53	-	-	-	-	-	07-15	07-15
8SCD..4/11/5T	1,59	4,94	2,85	-	-	-	-	-	07-15	07-15
8SCD..5/15/5T	1,96	6,58	3,80	-	-	-	-	-	07-15	07-15
8SCD..6/22/5T	2,26	7,41	4,28	-	-	-	-	-	15-22	15-22

\* Maximum values within operating range

8SCD-2p50-en\_a\_tp

### 8SCD, 8SCDS SERIES OPERATING CHARACTERISTICS



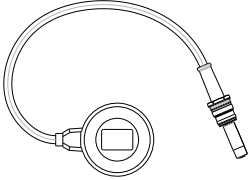
8SCD\_2P50\_A\_CH

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



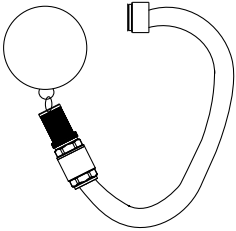
# ACCESSORIES

## ACCESSORIES FLOAT SWITCH KIT

Model	Part Number	Description
	109400540	Float switch kit for clean water Cable length 535 mm
	109400550	Float switch kit certified for drinking water Cable length 535 mm

En\_Rev\_A

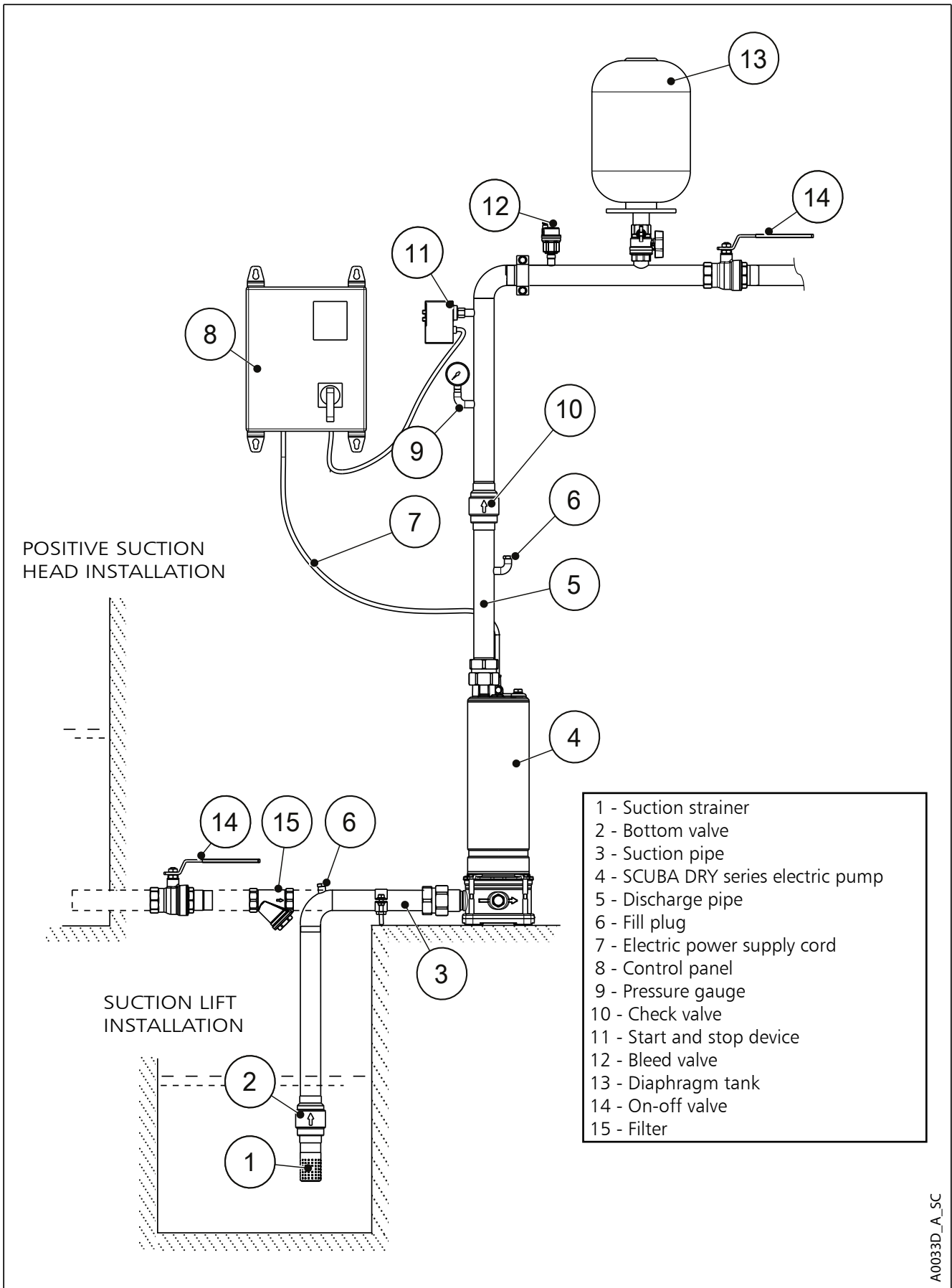
## FLOATING SUCTION DEVICE KIT

Model	Part Number	Description
	109400560	Floating suction device kit specific for rainwater collection tanks. It allows suction of clean water free of sedimented particles.

En\_Rev\_A

# **TECHNICAL APPENDIX**

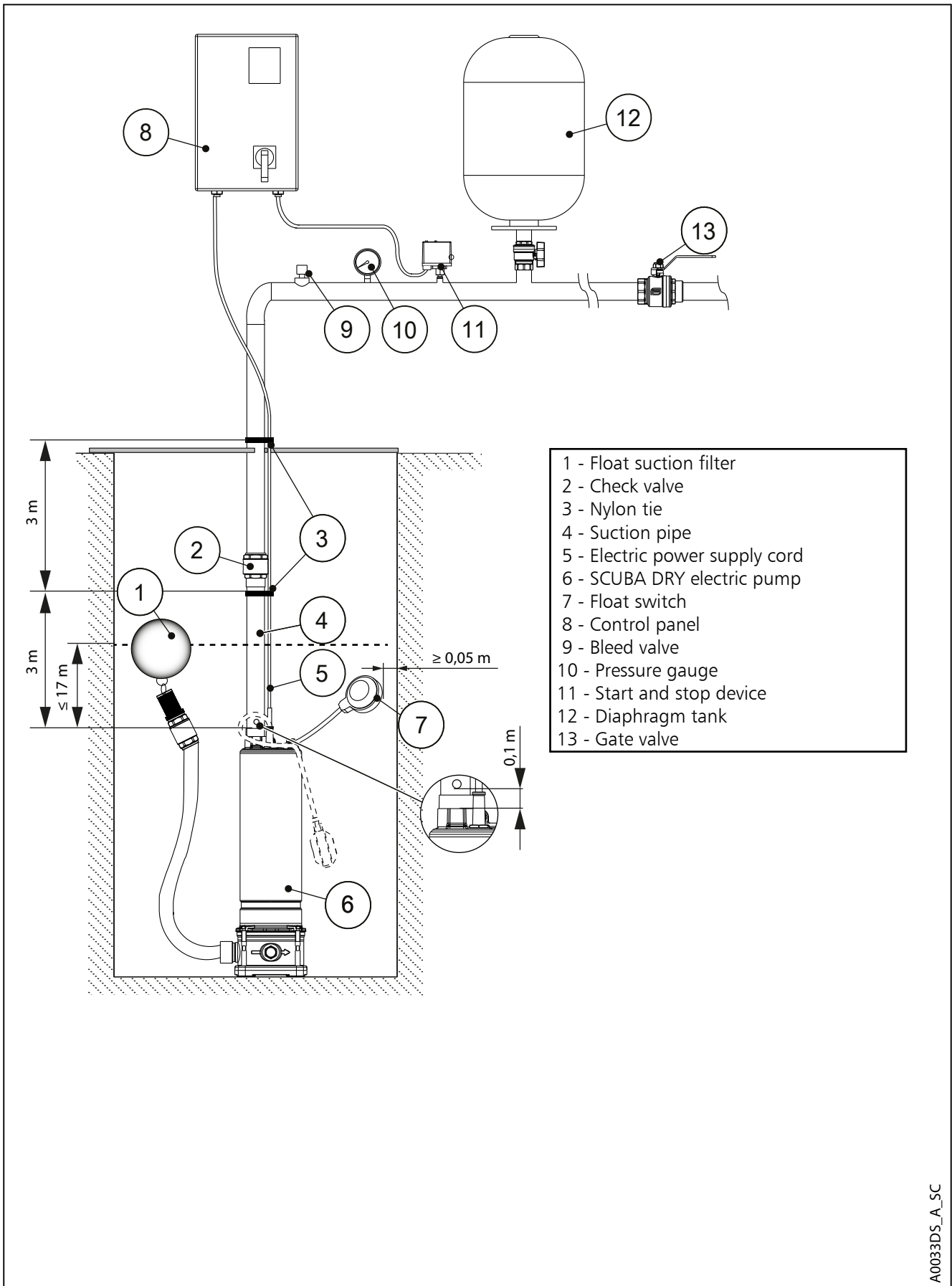
### EXAMPLE OF INSTALLATION OF A SCUBA DRY ELECTRIC PUMP ON THE SURFACE



A003D\_A\_SC



## EXAMPLE OF INSTALLATION OF A SUBMERGED SCUBA DRY ELECTRIC PUMP



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

PUMP TYPE SINGLE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	ABSORBED CURRENT A	VOLTAGE DROP %	CABLE GAUGE: 3 x ...mm <sup>2</sup>										
	Kw	HP					mm <sup>2</sup>	1	1,5	2,5	4	6	10	16	25		
							A max	17	23	32	42	54	75	100	127		
							Maximum lenght in metres										
1SC6/05/5..	0,55	0,75	220	0,944	4,11	4		57	85	142	227						
			240	0,940	4,26			60	90	150	240						
1SC7/07/5..	0,75	1	220	0,968	4,83			47	71	118	188	282					
			240	0,968	4,89			51	76	127	203	304					
1SC9/09/5..	0,9	1,2	220	0,979	5,68			40	59	99	158	237					
			240	0,979	5,68			43	65	108	173	259					
3SC4/05/5..	0,55	0,75	220	0,981	3,85			58	87	146	233	349	582				
			240	0,981	4,06			60	90	151	241	362	603				
3SC5/07/5..	0,75	1	220	0,970	4,72			48	72	120	192	288					
			240	0,970	4,80			52	77	129	206	309					
3SC7/09/5..	0,9	1,2	220	0,982	5,88			38	57	95	152	229	381				
			240	0,982	5,88			42	62	104	166	249	416				
3SC8/11/5..	1,1	1,5	220	0,984	6,85			33	49	82	131	196	326	522			
			240	0,984	6,85			36	53	89	142	214	356	570			
3SC9/15/5..	1,5	2	220	0,944	7,94			29	44	73	117	176	294				
			240	0,940	7,94			32	48	80	129						
5SC3/05/5..	0,55	0,75	220	0,968	3,87			59	88	147	235	352					
			240	0,968	4,08			61	91	152	243	365					
5SC4/07/5..	0,75	1	220	0,979	4,95			45	68	113	182	272					
			240	0,979	4,98			49	74	123	197	295					
5SC5/09/5..	0,9	1,2	220	0,981	5,72			39	59	98	157	235	392				
			240	0,981	5,72			43	64	107	171	257	428				
5SC6/11/5..	1,1	1,5	220	0,970	6,90			33	49	82	131	197					
			240	0,970	6,90			36	54	90	143	215					
5SC8/15/5..	1,5	2	220	0,982	9,00		25	37	62	100	149	249					
			240	0,982	9,00		27	41	68	109	163	272					
8SC2/05/5..	0,55	0,75	220	0,984	4,10		55	82	136	218	327	545	872				
			240	0,984	4,25		57	86	143	230	344	574	918				
8SC3/09/5..	0,9	1,2	220	0,970	5,66		40	60	100	160	240	401					
			240	0,970	5,66		44	66	109	175	262						
8SC6/15/5..	1,5	2	220	0,984	10,4		21	32	54	86	129	215	344				
			240	0,984	10,4		23	35	59	94	141	235	375				

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

scuba-2p50M-en\_a\_te

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

PUMP TYPE THREE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	ABSORBED CURRENT A	VOLTAGE DROP %	CABLE GAUGE: 4 x ...mm <sup>2</sup>										
	Kw	HP					mm <sup>2</sup>	1	1,5	2,5	4	6	10	16	25		
			A max	17	23	32	42	54	75	100	127	Maximum lenght in metres					
1SC6/05/5T	0,55	0,75	220	0,809	2,75	4		128	191	319							
			240	0,809	2,81		137	205	341								
			380	0,809	1,59		382										
			415	0,809	1,62		409										
1SC7/07/5T	0,75	1	220	0,728	3,71			105	158	263	421						
			240	0,728	4,04		106	158	264	422							
			380	0,728	2,14		315										
			415	0,728	2,33		316										
1SC9/09/5T	0,9	1,2	220	0,776	4,16			88	132	220	352						
			240	0,776	4,38		91	137	228	365							
			380	0,776	2,40		264	395									
			415	0,776	2,53		273	410									
3SC4/05/5T	0,55	0,75	220	0,810	2,60			135	203	338	540						
			240	0,810	2,68		143	214	356	570							
			380	0,810	1,50		404	606									
			415	0,810	1,55		427	641									
3SC5/07/5T	0,75	1	220	0,737	3,65		106	158	264	422							
			240	0,737	3,98	106	158	264	422								
			380	0,737	2,11	316	474										
			415	0,737	2,30	316	474										
3SC7/09/5T	0,9	1,2	220	0,793	4,26		84	126	210	336							
			240	0,793	4,47	88	131	219	350								
			380	0,793	2,46	252	378										
			415	0,793	2,58	262	393										
3SC8/15/5T	1,5	2	220	0,809	5,35		66	98	164								
			240	0,809	5,84	66	98	164									
			380	0,809	3,09	196											
			415	0,809	3,37	197											
3SC9/22/5T	2,2	3	220	0,728	5,84		67	100	167	268							
			240	0,728	6,37	67	100	167	267								
			380	0,728	3,37	200											
			415	0,728	3,68	200											

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

scuba1-2p50T-en\_a\_te

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

PUMP TYPE THREE-PHASE	RATED POWER		RATED VOLTAGE V	Cos φ	ABSORBED CURRENT A	VOLTAGE DROP %	CABLE GAUGE: 4 x ...mm <sup>2</sup>											
	Kw	HP					mm <sup>2</sup>	1	1,5	2,5	4	6	10	16	25			
							A max	17	23	32	42	54	75	100	127			
5SC3/05T	0,55	0,75	220	0,776	4,40	4		83	125	208	333							
			240	0,776	4,40			91	136	227	363							
			380	0,776	2,54			249	374									
			415	0,776	2,54			272	408									
			220	0,810	4,68			75	112	187	300							
5SC4/07T	0,75	1	240	0,810	4,68			82	123	204	327							
			380	0,810	2,70			224	337									
			415	0,810	2,70			245	368									
			220	0,737	4,16			93	139	232	371							
5SC5/09T	0,9	1,2	240	0,737	4,16			101	152	253	405							
			380	0,737	2,40			278	416									
			415	0,737	2,40			303	455									
			220	0,793	4,50			80	119	199	319							
5SC6/11T	1,1	1,5	240	0,793	4,50			87	130	217	348							
			380	0,793	2,60			238	357									
			415	0,793	2,60			260	390									
			220	0,833	4,94			69	104	173	276	414						
5SC7/15T	1,5	1,5	240	0,833	4,94			75	113	188	301	452						
			380	0,833	2,85			207	310									
			415	0,833	2,85			226	339									
			220	0,809	2,81			125	188	313								
5SC8/22T	2,2	3	240	0,809	2,81			136	205	341								
			380	0,809	1,62			375										
			415	0,809	1,62			409										
			220	0,728	4,12			95	142	237	379							
8SC2/05T	0,55	0,75	240	0,728	4,12			103	155	258	414							
			380	0,728	2,38			283										
			415	0,728	2,38			309										
			220	0,776	4,40		83	125	208	333								
8SC3/09T	0,9	1,2	240	0,776	4,40		91	136	227	363								
			380	0,776	2,54		249	374										
			415	0,776	2,54		272	408										
			220	0,810	4,68		75	112	187	300								
8SC4/11T	1,1	1,5	240	0,810	4,68		82	123	204	327								
			380	0,810	2,70		224	337										
			415	0,810	2,70		245	368										
			220	0,737	4,16		93	139	232	371								
8SC5/15T	1,5	2	240	0,737	4,16		101	152	253	405								
			380	0,737	2,40		278	416										
			415	0,737	2,40		303	455										
			220	0,793	4,50		80	119	199	319								
8SC6/22T	2,2	3	240	0,793	4,50		87	130	217	348								
			380	0,793	2,60		238	357										
			415	0,793	2,60		260	390										

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

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## 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

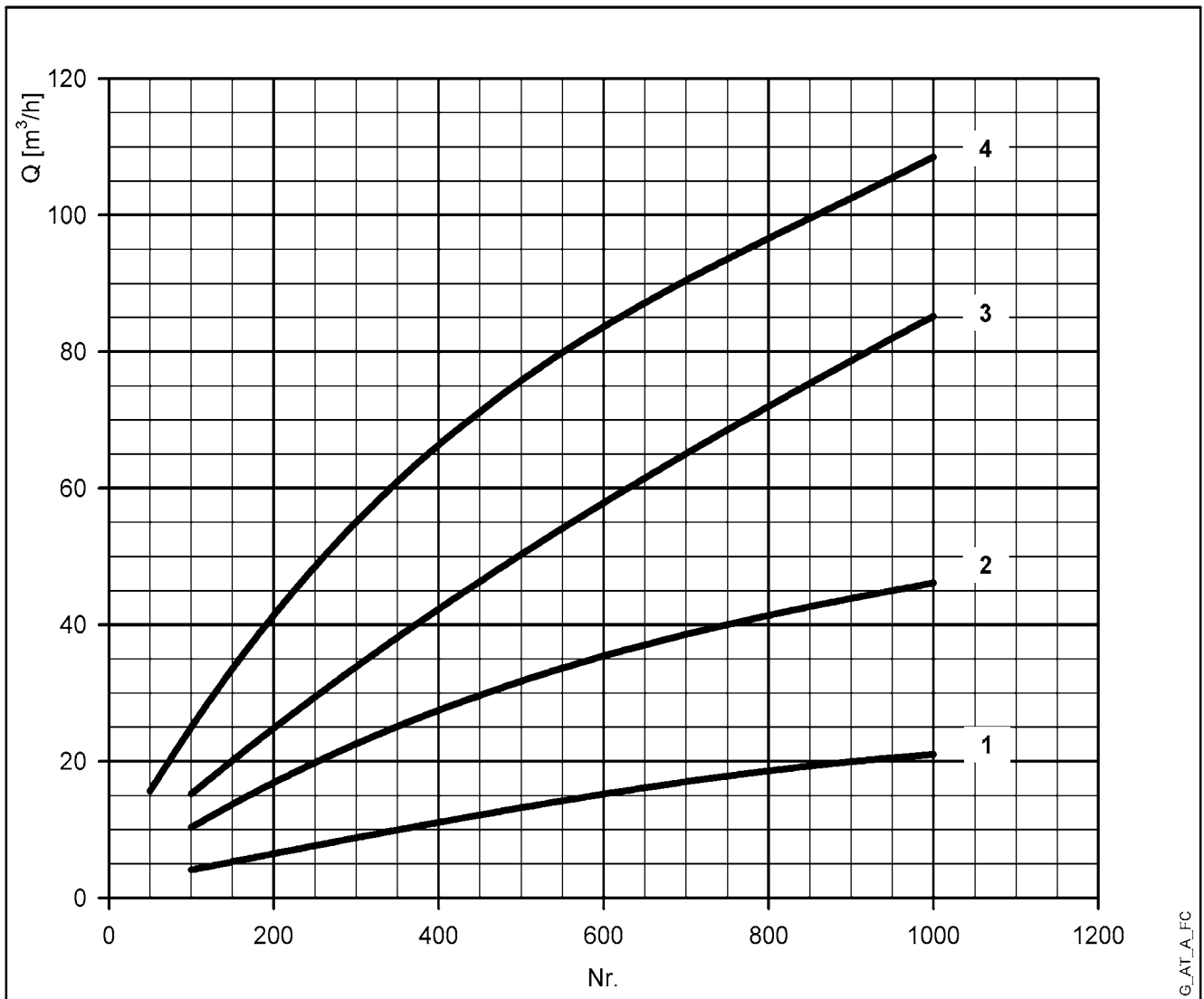
For seaside resorts, a flow rate increased by at least 20% must be considered.

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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:

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

where:

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

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

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

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

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

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

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

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

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

Friction loss is shown in the tables 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: 25 m<sup>3</sup>/h

Head for required delivery: 70 m.

Suction lift: 3,5 m.

The selection is an 33SV3G075T pump whose NPSH required value is, at 25 m<sup>3</sup>/h, of 2 m.

For water at 15 °C

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

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

By substituting the parameters in formula  $\textcircled{1}$  with the numeric values above, we have:

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

from which we have: 6,8 > 3,9

The relation is therefore verified.



**VAPOUR PRESSURE**

**VAPOUR PRESSURE  $p_s$  AND  $\rho$  DENSITY OF WATER TABLE**

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

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## TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

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

hr = flow resistance for 100 m of straight pipeline (m)

V = water speed (m/s)

G-at-pct-en\_b\_th

## FLOW RESISTANCE

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

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

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

G-a-pcv-en\_b\_th

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

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

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

## VOLUMETRIC CAPACITY

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

## PRESSURE AND HEAD

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

## LENGTH

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

## VOLUME

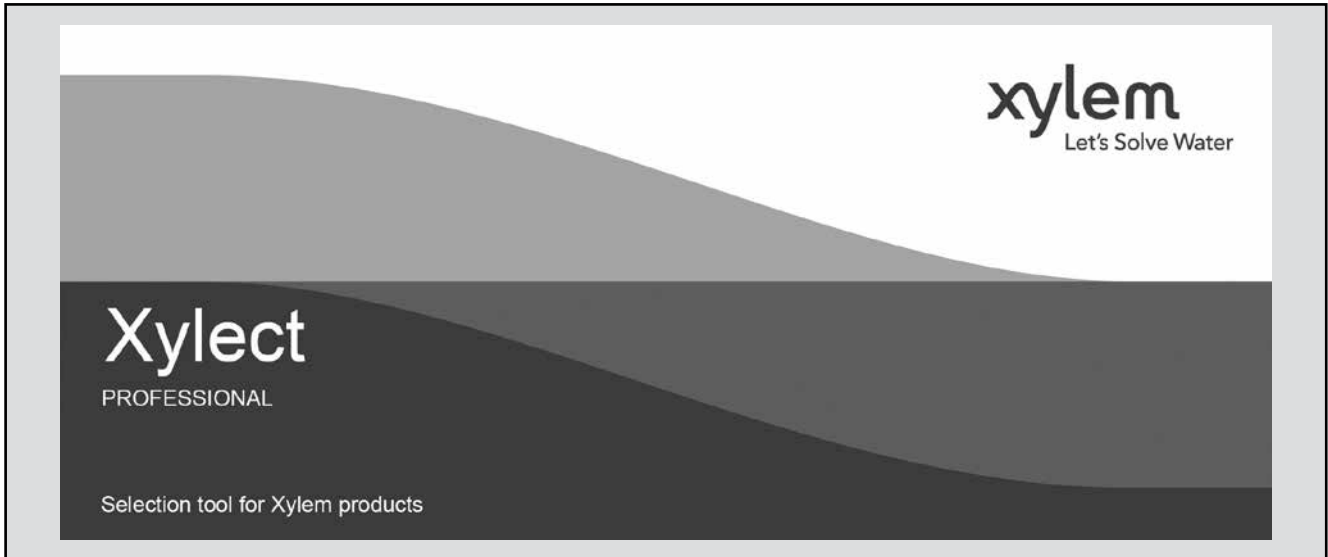
Cubic metre m <sup>3</sup>	Litre L	Millilitre ml	Imperial gallon imp. gal.	U.S. gallon US gal.	Cubic foot ft <sup>3</sup>
<b>1,0000</b>	1 000,0000	1 x 10 <sup>6</sup>	219,9694	264,1720	35,3147
0,0010	<b>1,0000</b>	1 000,0000	0,2200	0,2642	0,0353
1 x 10 <sup>-6</sup>	0,0010	<b>1,0000</b>	2,2 x 10 <sup>-4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

## TEMPERATURE

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

G-at\_pp-en\_b\_sc

**FURTHER PRODUCT SELECTION  
AND DOCUMENTATION**  
**Xylect**



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

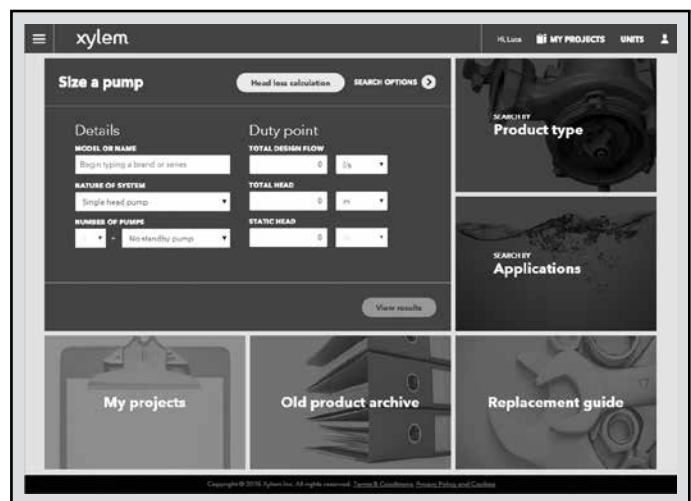
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect gives a detailed output:

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



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

## FURTHER PRODUCT SELECTION AND DOCUMENTATION

### Xylect



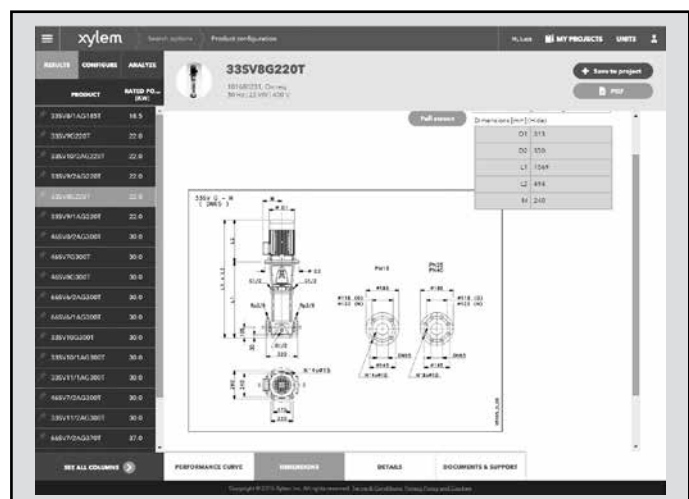
The detailed output makes it easy to select the optimal pump from the given alternatives.

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

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

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

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



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



# Xylem |'zīləm|

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

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

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



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