IWTM
water by design

PROTECTOR MOBILE

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TABLE OF CONTENTS

PROTECTOR MOBILE DESCRIPTION

ALL-IN-ONE FILTRATION AND WATER TREATMENT UNIT.

WHAT IS IT?

The IWTM Protector™ mobile is a high flow rinsing rig used for pre commissioning cleaning and fast remedial cleaning, when needing to strip away the system debris and existing chemicals from closed heating or cooling systems. The Protector Mobiles have pumps, stainless steel micron filters, high power magnets, pressure gauges, optional bag filters down to 1 micron and are fitted with magnesium anode technology resulting in cleaning and engineering the water simultaneously.
Once the system is cleaned, the Mobile is removed and our Protector units stay in place and **engineer the water for life**.

The Protector Mobile comes as three sizes. P10 Mobile, P40 Mobile Size 1 and P40 Mobile Size 2. P10 Mobile has a smaller area for collecting debris. P40 Size 1 has a smaller size pump than Mobile 2, which has a larger pump and the ability to be connected to create a multi-unit for systems with larger capacity.

Strengths of the multi-unit solution:

- The systems can be separated, so they are easier to ship/transport and carry around.
- When you have completed treating one large system, you just remove the manifold, separate the assembly into single units and you can use them for other customers that need only a single one and vice versa.
- Same spare parts for all units so ease of service and upkeep.

NEXT GENERATION OF ELECTROCHEMISTRY

Please refer to page 7/8 for the flushing velocities and flow rates.

The units provide faster clean-up of old systems and quicker compliance with pre commissioning targets on new systems due to the higher flow rates through the reaction tank (cathode) and the ss micron filter that enables finer filtration.

The unscreened larger anodes last longer and release the magnesium hydroxide quicker for faster pH control. Compliance with VDI 2035 is still obtained as the anodes sit inside the ss micron filter to capture the magnesium residue when the anodes expire.

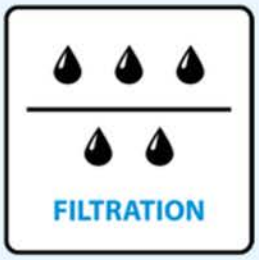
HOW DOES IT WORK?

The water enters from the inlet connection, then passes around and down past magnets and anodes. The dry internal magnets will prevent the ss micron filter from clogging up as the magnet sleeve will retain the magnetic particles (magnetite) in place until the magnet is removed for cleaning and blow down. During this process, oxygen will be consumed by dissolving the anodes, and excess air (blisters) will rise up and out of the vent valve. The water will now flow through the ss micron filter / filter bag so that particles will physically be stopped by either of the filters. The result will be a clear van with increased pH, without oxygen or particles and sludge.

MAINTENANCE

For the general maintenance, please follow the instructions in the appropriate Protector P10/P40 manual. When the progressive build-up of suspended solids retained by the stainless-steel micron filter causes an excessive increase of the pressure differential between the inlet and outlet connections, the filter must be cleaned. (differential pressure of inlet and outlet pressure gauge, can be done by automatic drain).
To perform the cleaning operations, there are two options either a normal back flush of the ss micron filter, or by complete removal and washing of the filter.

PROTECTOR MOBILE FUNCTIONS



PARTICLE FILTRATION

MAGNETIC PROTECTION

REDUCES DISSOLVED OXYGEN

CORROSION PREVENTION

Prevents Corrosion

Protector's water treatment features prevent corrosion in the system. This is achieved thanks to magnesium anodes that lower oxygen, regulate pH and reduce electrical conductivity.

All In One

Protector is an ″all in one solution″. It combines several different technologies in one single extremely functional and reliable device.

Traps Ferrous Particles

Protector is equipped with Neodymium Magnets that trap ferrous particles, drastically increasing the time before manual intervention is needed.

Removes Contamination

Protector cleans and restores recirculating systems by removing suspended particles.

+ PROVIDES	- REPLACES
Sludge and particle removal	Bag filters
Magnetite Removal	Magnet filters
pH adjustment	Chemicals
Oxygen consumption	Air separators
Cathodic / anodic water treatment	Dosing pots + automatic dosing systems

PROTECTOR FUNCTIONS

ONE EXAMPLE OF TEMPORARY CONNECTION TO THE SYSTEM

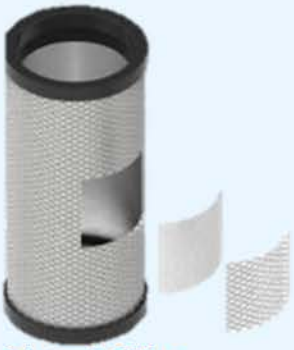
Protector keeps your system clean by adapting to your needs. Two different filtering elements, completely interchangeable, remove suspended particles from the recirculating system.

The use of different gauge filters by progressive stepped filtration helps to avoid filters blocking too early.

FILTERING ELEMENTS

PARTICLE FILTRATION

Protector comes as standard with a robust stainless steel filter which is 40 micron nominal. Stainless steel AISI 316.



2-Layer S.S Filter

The ss micron filter has a large surface which gives a long operating time before cleaning and thus less flushing and refilling.

FINE FILTRATION

The ss micron filter can be replaced with filter bags with a filter degree down to 1 µm.

Bag Filter

DETAILED EXTERNAL & INTERNAL VIEW

1 **Vent pipe + automatic vent valve:** An automatic vent valve is installed at the end of the vent pipe.

2 **Quick release eye bolts:** For ease of maintenance and filter inspection and change.

3 **Inlet pressure gauge:** Stainless Steel pressure gauge that measures the inlet pressure. Scale 0-10 bar.

4 **Amp meter:** This indicator device measures the intensity of the current produced by the anode relative to the cathode, which is directly related to the corrosiveness of the system water.

5 **Amp meter button:** Push the red button to activate the amp meter and read the value.

6 **Outlet pressure gauge:** Stainless Steel pressure gauge that measures the outlet pressure. Scale 0-10 bar.

7 **Drain:** The filter is emptied with a manual valve in- stalled on the drain pipe. Can be easily connected to any existing drain manifold / pipe.

9 **Pump control panel:** Provides electrical isolation and pump speed control

8 **Circulation pump:**
P10 + P40 V1 : LOWARA CEAM 80/5 230V
P40 V2: LOWARA CEAM 210/4 230V

1 **Vent valve + vent pipe (not shown):** An automatic vent valve is installed at the end of the vent pipe.

2 **Inlet diverter:** Water entering the Protector is immediately directed towards the inner walls, accelerating the flow and creating a “vortex” that improves separation efficiency.

3 **Neodymium Magnets:** These dry magnets are installed in front of the sacrificial anodes to protect them from ferrous particles, the neodymium magnets (total length 600mm) are coated in stainless steel to increase their durability and to make maintenance easier. In fact, they do not require manual cleaning because, once extracted from the filter thanks to the handle located on the lid, the dirt precipitates into the filtering element.

4 **Sacrificial Anodes:** Magnesium Anodes that provide Cathodic protection and lower the fluid›s conductivity. The anodes also scavenge oxygen and regulate the pH.

5 **Interchangeable filter elements / bags:** Stainless steel filters comes as standard of 40 micron nominal. S.S micron filter can be replaced with bag filters down to 1 µm. This guarantees a supremely clean circulation water that provides optimal values for the plant and its components.

6 **Bottom with openings:** The openings ensure that a minimum amount of dirt remains deposited on the bottom when draining the filter. This lengthens the time before having to clean the filter manually.

7 **Drain:** The filter is emptied with a manual valve in- stalled on the drain pipe. Can be easily connected to any existing drain manifold / pipe.

UNIT SIZES & PERFORMANCE

PROTECTOR MOBILE P10 :

Protector P10 Mobile comes as one size with the smallest area for debris collection and same size pump unit as P40 Size 1. (LOWARA CEAM 80/5 230V). This covers up to DN40 1.08 m/s flushing velocity and flushing flow rate of 3.88m ^{3}/ (1.49 l/s).

PROTECTOR MOBILE P40 SIZE 1 :

Protector P40 Mobile Size 1 comes as one size (LOWARA CEAM 80/5 230V), with a smaller pump unit than Size 2. This covers up to DN40 1.08 m/s flushing velocity and flushing flow rate of 3.88m ^{3}/ (1.49 l/s).

PROTECTOR MOBILE P40 SIZE 2 :

Protector Mobile 2 has a larger pump size (LOWARA CEAM 210/4 230V), and can be connected to create multi-units to accommodate up to DN100.

One unit = Up to DN65 1.15 m/s flushing velocity and flushing flow rate of 15 .4 m^{3}/h (4.29 l/s)

Two units = Up to DN80 1.17 m/s flushing velocity and flushing flow rate 26m^{3}/h (7.22 l/s)

Three units = Up to DN100 1.21 m/s flushing velocity and flushing flow rate 39-40 m^{3}/h (11 l/s)

UNIT SIZES & DIMENSIONS

FLUSHING VELOCITIES AND FLOW RATES:

MOBILE P10 AND P40 SIZE 1

MOBILE P40 SIZE 2

Nominal pipe size (mm)	Internal diameter (mm)	Flushing velocity (m/s)	Flushing flow rate (l/s)
15	16.1	0.96	0.20
20	21.7	1.00	0.37
25	27.3	1.03	0.60
32	36.0	1.06	1.08
40	41.9	1.08	1.49
50	53.2	1.11	2.47
65	68.9	1.15	4.29
80	80.9	1.17	6.01
100	105.3	1.21	10.5

1 UNIT

1 UNIT

2 UNITS

3 UNITS

Mobile P10 and P40 size 1 can accommodate the flushing velocities required up to 40mm pipework.

For 50-65mm pipework, you will require 1 x P40 Mobile Size 2.

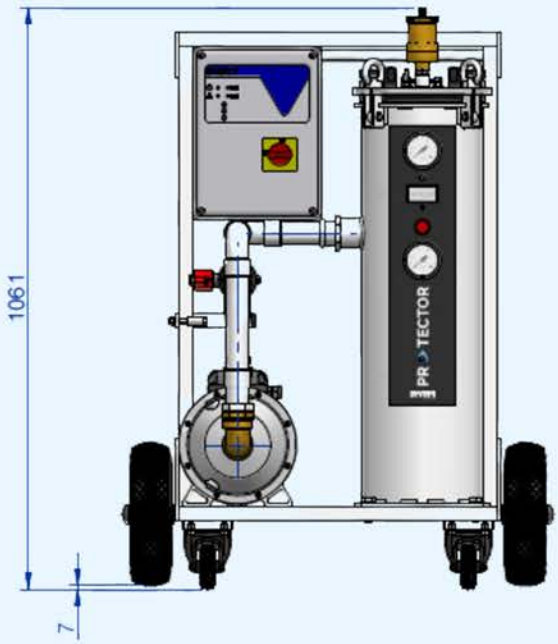
80mm pipework you will require 2 x P40 Mobile Size 2's.

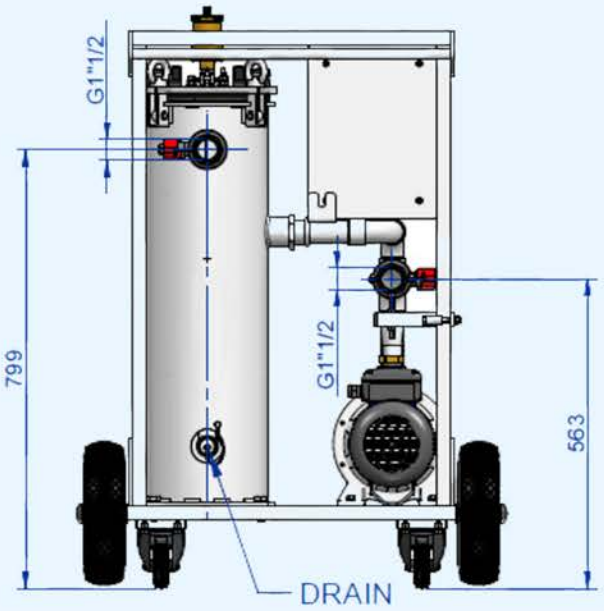
100mm you will require 3 x P40 Mobile Size 2's.

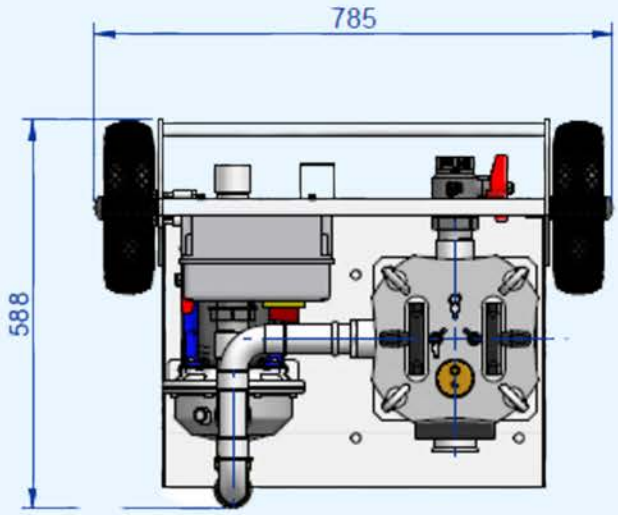
Note: full details of the pump controller and pumps are supplied separately in the manufacturers manuals

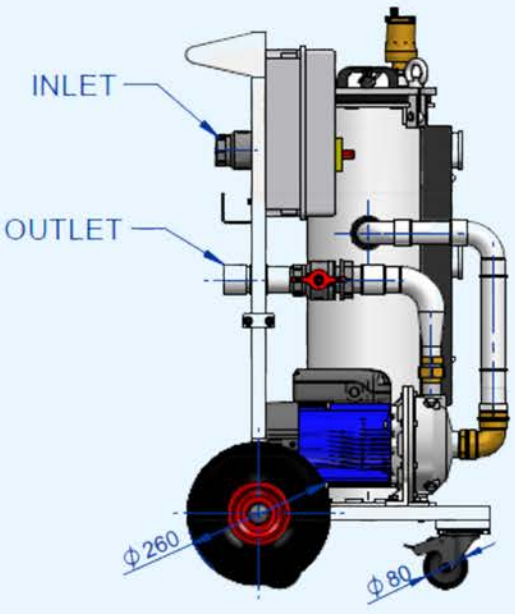
UNIT SIZES & DIMENSIONS

PROTECTOR MOBILE P10:









UNIT SIZES & DIMENSIONS

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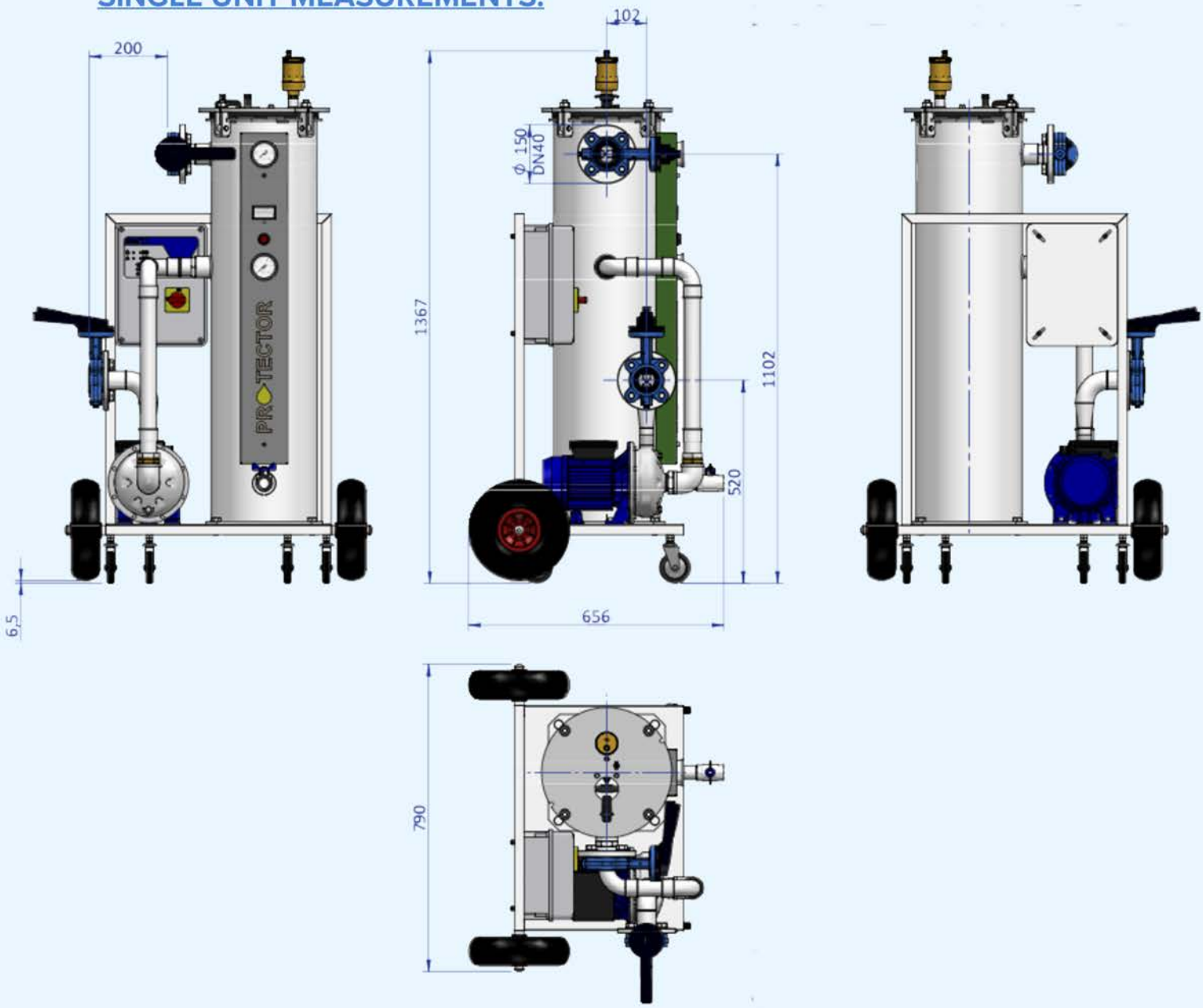
P40 MOBILE SIZE 1

SINGLE UNIT MEASUREMENTS:

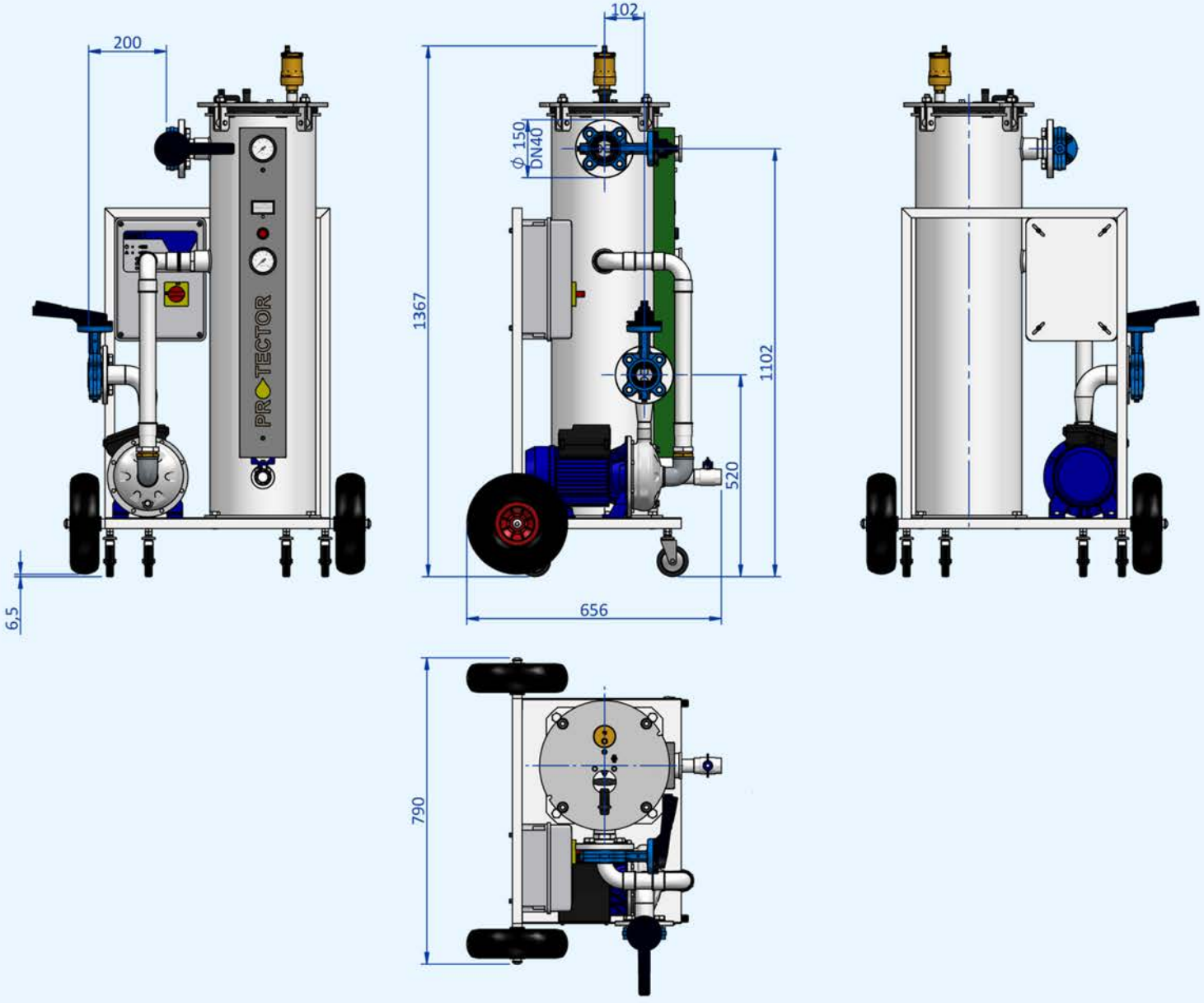


UNIT SIZES & DIMENSIONS

water by design

P40 MOBILE SIZE 2,

SINGLE UNIT MEASUREMENTS:

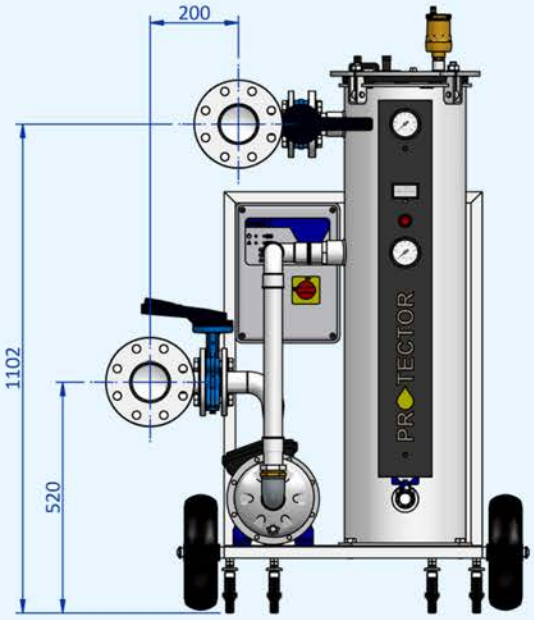


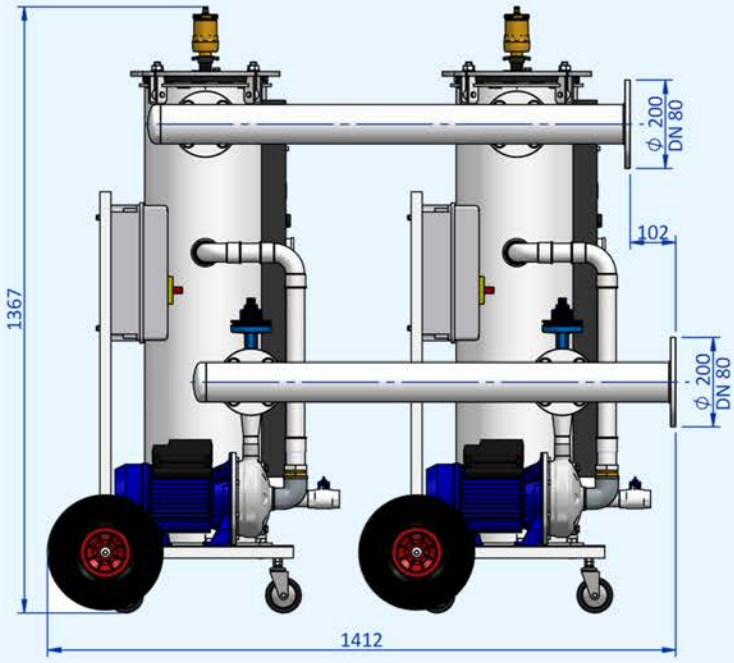
UNIT SIZES & DIMENSIONS

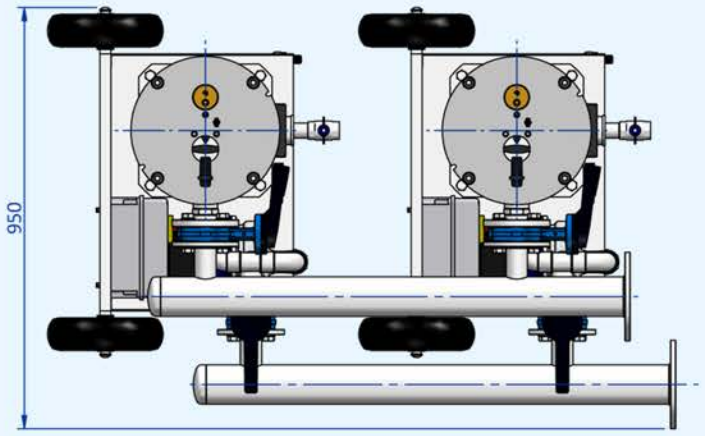
water by design

P40 MOBILE SIZE 2,

DOUBLE UNIT MEASUREMENTS:







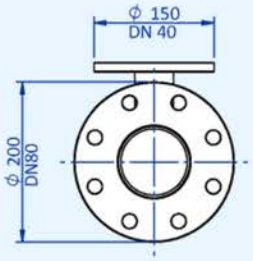
UNIT SIZES & DIMENSIONS

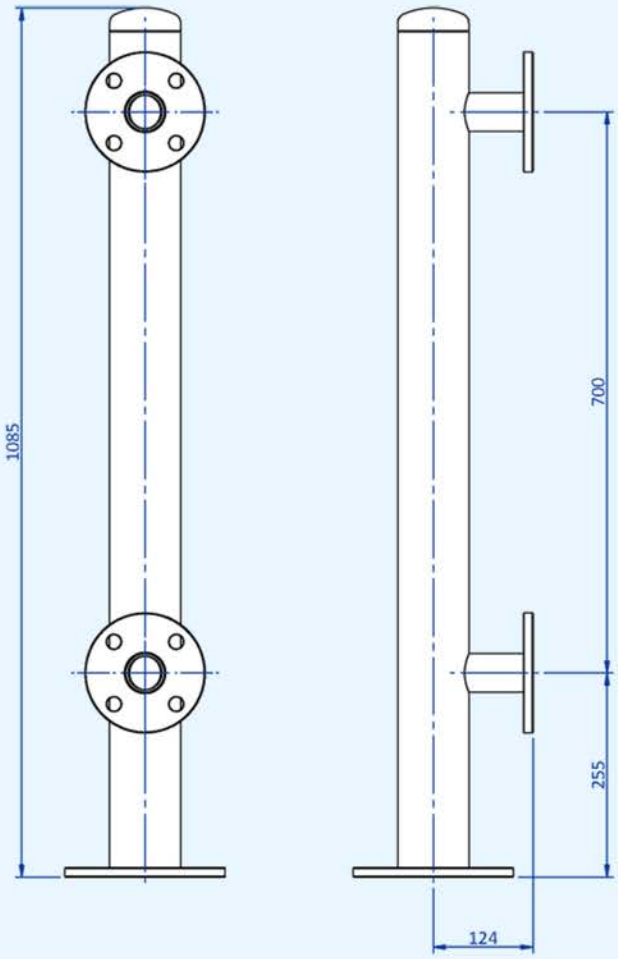
water by design

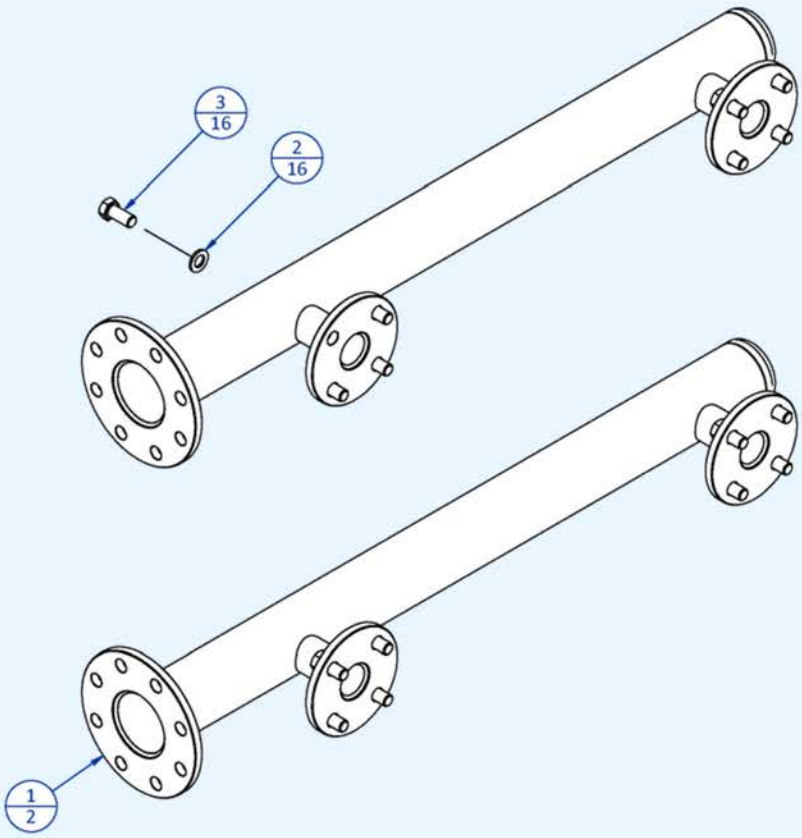
P40 MOBILE 2,

DOUBLE UNIT,

MANIFOLD MEASUREMENTS:





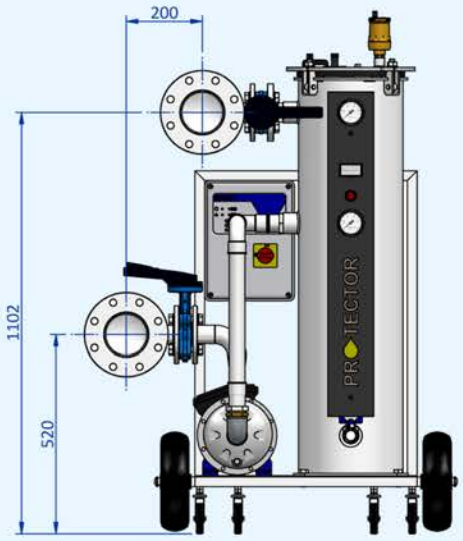


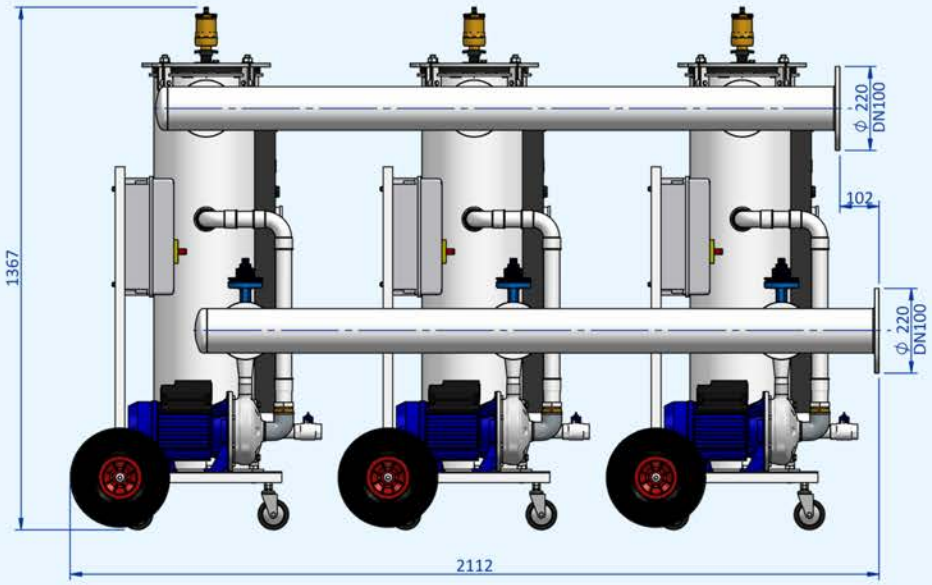
UNIT SIZES & DIMENSIONS

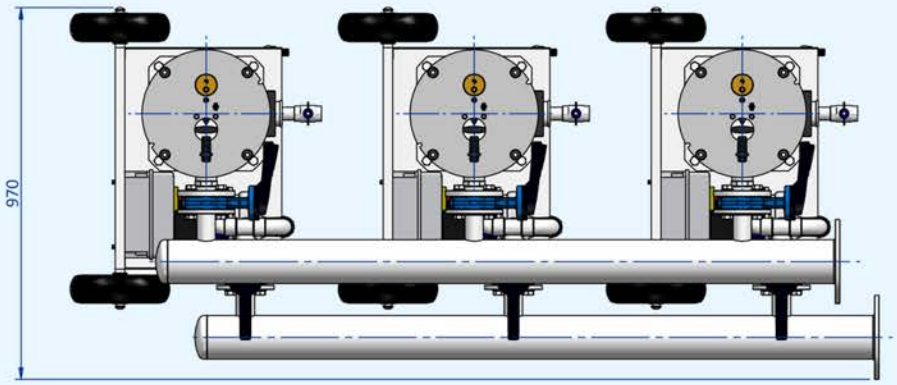
water by design

P40 MOBILE SIZE 2,

TRIPLE UNIT, MEASUREMENTS:







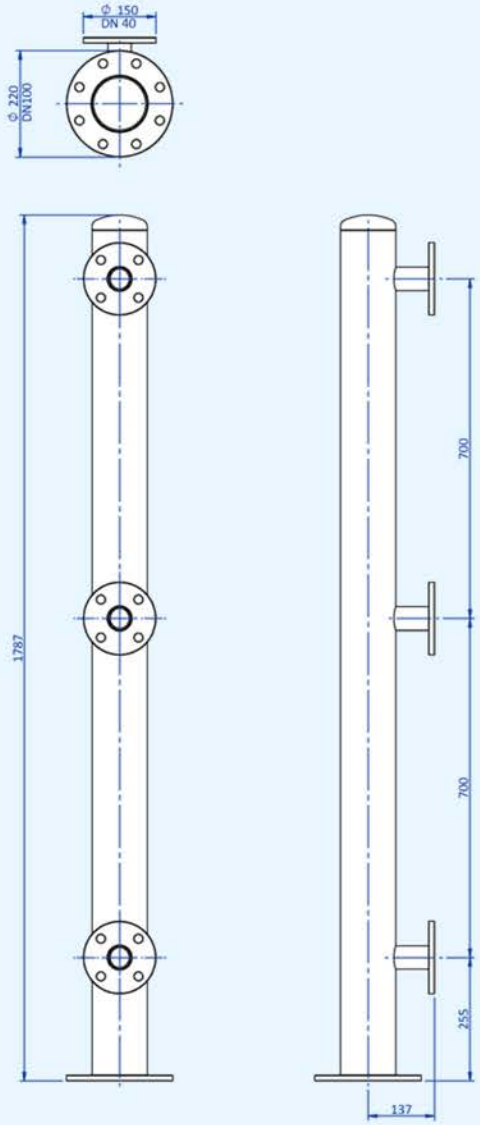
UNIT SIZES & DIMENSIONS

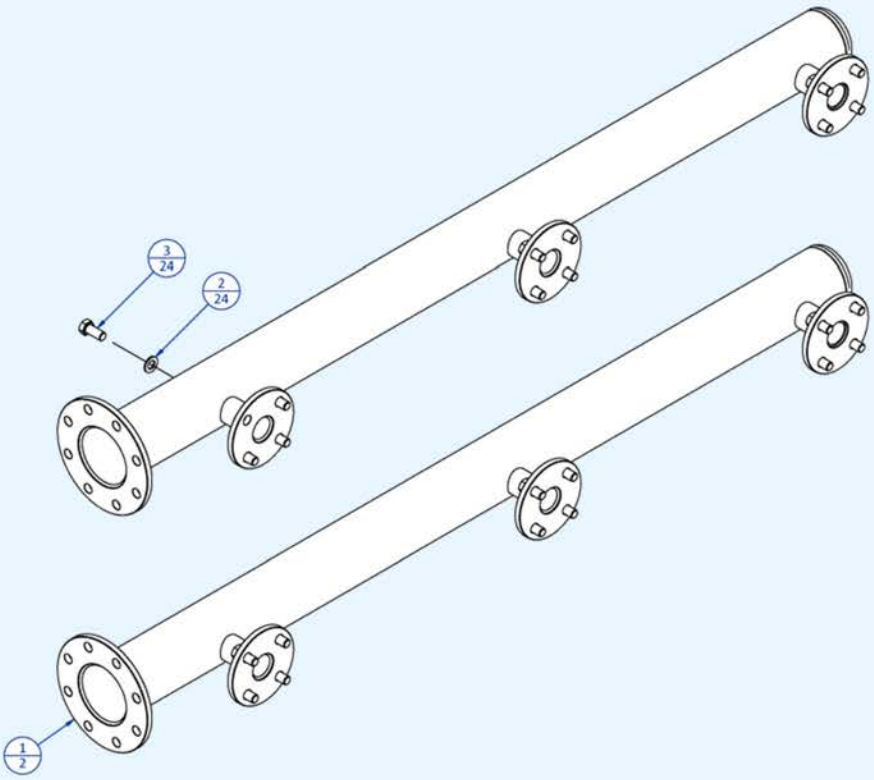
water by design

P40 MOBILE SIZE 2,

TRIPLE UNIT,

MANIFOLD MEASUREMENTS:

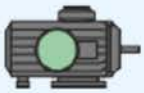




PUMP OPERATION

1. Ensure the pump is full of water and the pump isolation valve is open.
2. Close the pump by pass valve so that water now flows down and through the pump
3.

FIX GREEN LED power on;
FLASHING GREEN LED electronic board in over-temperature;
GREEN LED OFF device not powered.



FIXED GREEN LED pump running.
GREEN LED OFF electric pump in stand-by.

RED LED 1 FLASH minimum current alarm;
RED LED 2 FLASHES maximum current alarm;
RED LED 3 FLASHES level alarm from probe input;
RED LED 4 FLASHES max number of startings per hour exceeded;
RED LED 6 FLASHES failure or incorrect phase sequence (three-phase version);

AUT automatic operation button;
FIXED GREEN LED automatic operation active;
GREEN LED OFF automatic operation disabled.

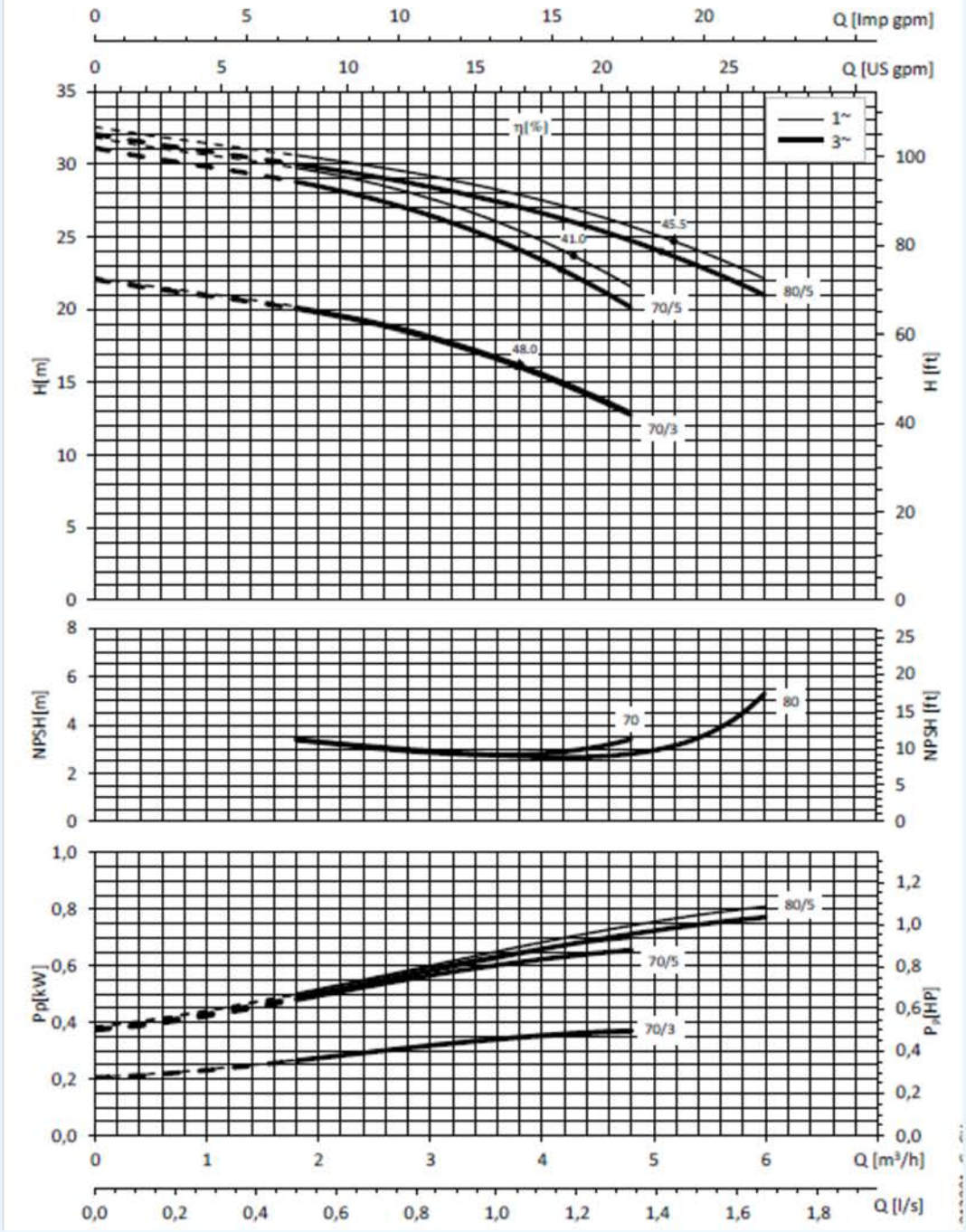
Button for motor stop or stand-by operation;
Button '0' pressed for 5 seconds starts the engine, when the button is released the pump switches off (MANUAL mode).

PUMP PERFORMANCE

P10 MOBILE AND P40 MOBILE SIZE 1:

CEA-CIE SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES

CEA-CIE70 / CEA-CIE80	~ 2900 [rpm]	ISO 9906:2012 - Grade 3B

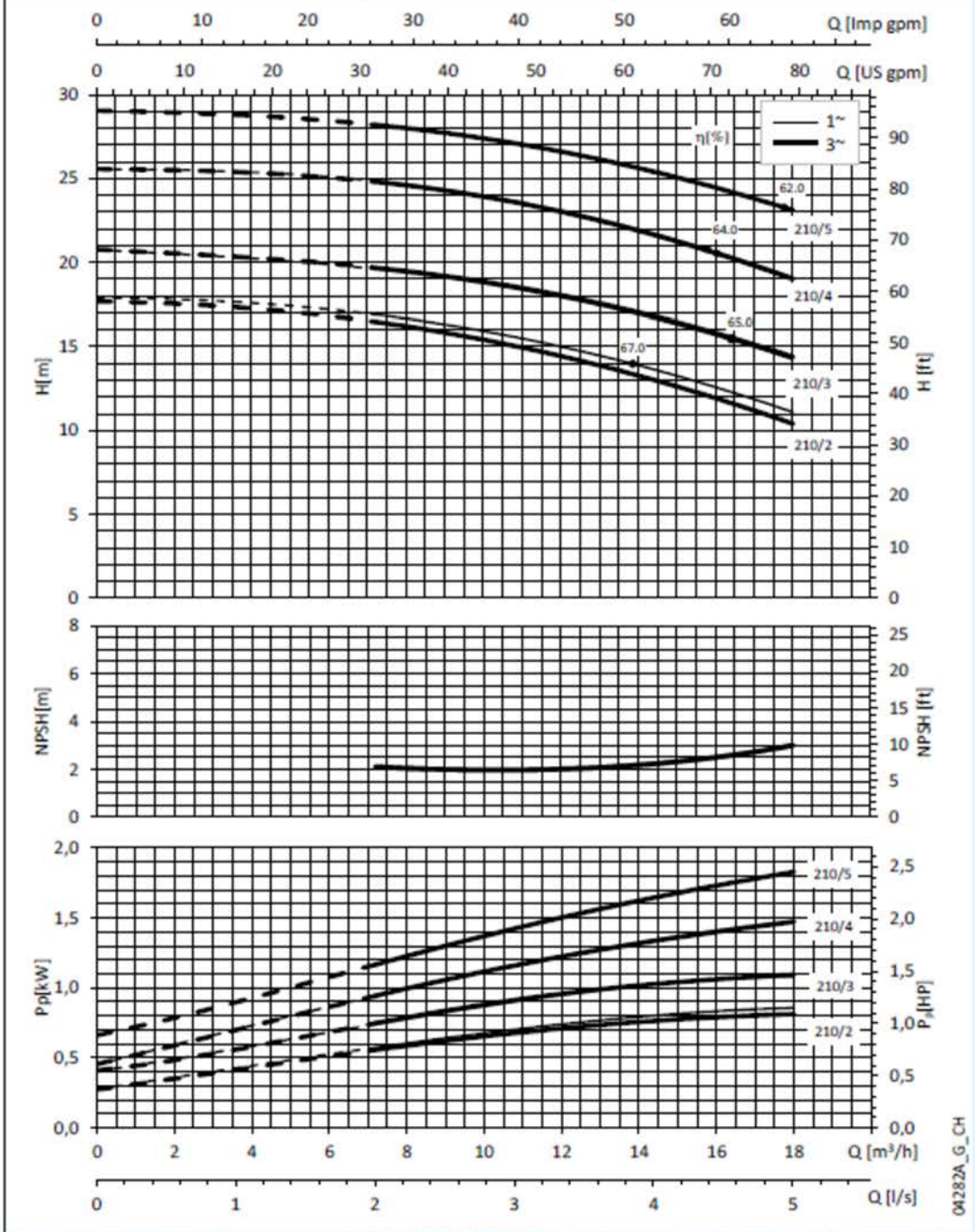


PUMP PERFORMANCE

P40 MOBILE SIZE 2:

CEA-CIE SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES

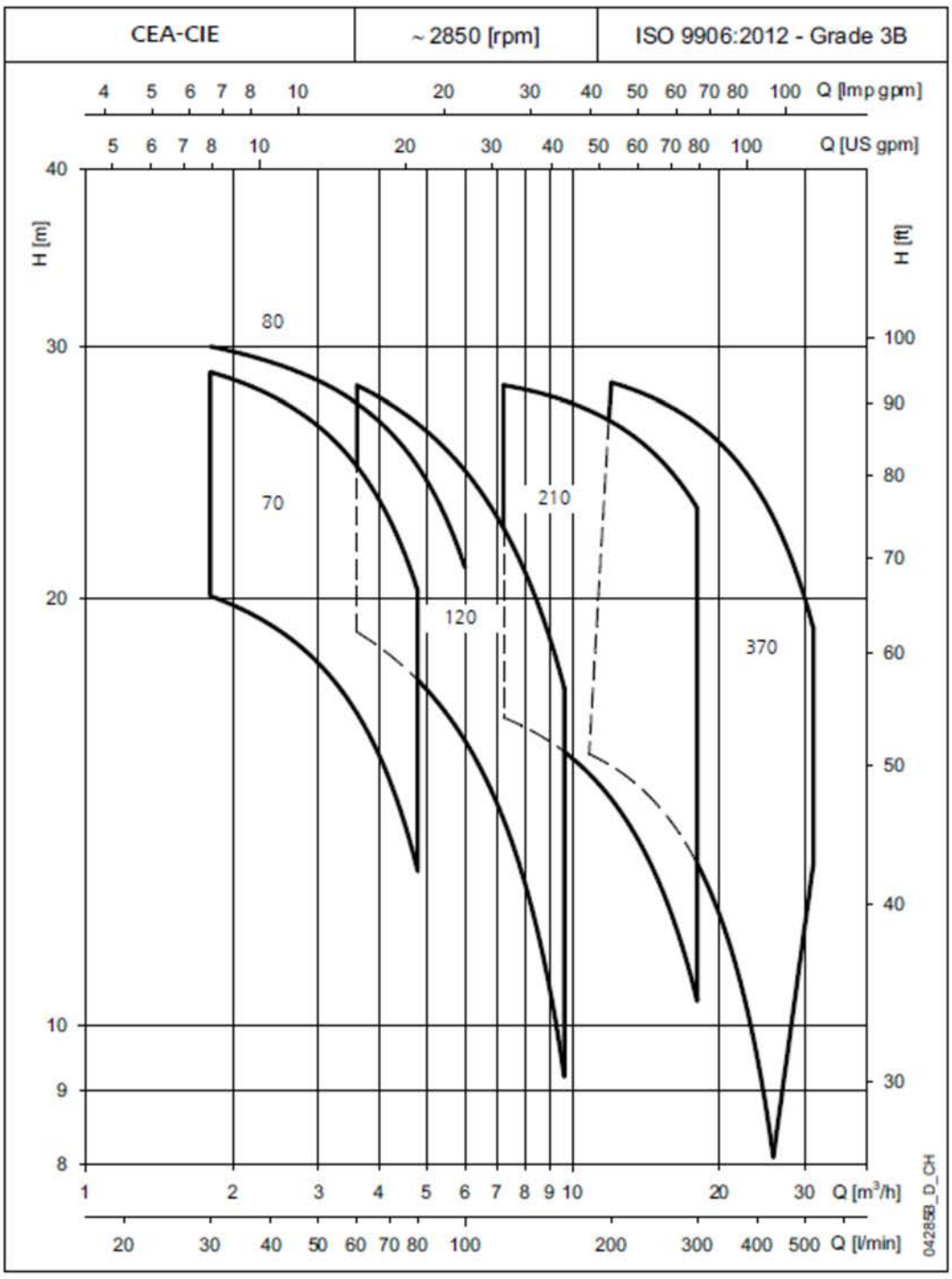
CEA-CIE210	~ 2900 [rpm]	ISO 9906:2012 - Grade 3B



PUMP PERFORMANCE

P10 MOBILE, P40 MOBILE SIZE 1 AND 2:

CEA-CIE SERIES
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES



PUMP PERFORMANCE

P10 MOBILE, P40 MOBILE SIZE 1 AND 2:

CEA-CIE SERIES
TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 2 POLES

PUMP TYPE CEA.. CIE..	VERSION	MOTOR P_N kW	MOTOR TYPE	ELECTRIC PUMP * P_1 kW	ELECTRIC PUMP * I 220-240 V A	ELECTRIC PUMP * I 380-415 V A	≥ MEI (1)	Q = DELIVERY l/min 0	30	45	60	75	90	105	120	135	160
								m^3/h 0	1,8	2,7	3,6	4,5	5,4	6,3	7,2	8,1	9,6
								H = TOTAL HEAD IN METRES OF COLUMN OF WATER									
70/3	1 ~	0,4	SM63BG/1045	0,55	2,33	-	-	22,2	20,2	18,8	16,8	14,1					
70/5		0,75	SM80BG/1075	0,91	4,05	-	-	31,9	29,7	28,3	26,0	22,8					
80/5		1,1	SM80BG/1115	1,06	4,70	-	-	32,6	30,6	29,6	28,3	26,5	24,1				
120/3		0,55	SM71BG/1055	0,79	3,47	-	0,40	22,3			18,7	17,6	16,5	15,1	13,6	11,9	8,7
120/5		1,1	SM80BG/1115	1,30	5,73	-	0,40	32,1			28,5	27,4	26,1	24,6	22,9	21,0	17,6
70/3	3 ~	0,4	SM63BG/304	0,61	2,51	1,45	-	22,1	20,0	18,7	16,6	13,8					
70/5		0,55	SM71BG/305	0,88	2,86	1,65	-	31,1	28,8	27,2	24,8	21,5					
80/5		0,75	SM80BG/307 PE	0,98	3,08	1,78	-	32,1	30,0	28,9	27,4	25,5	23,0				
120/3		0,55	SM71BG/305	0,82	2,74	1,58	0,40	22,5			18,9	17,9	16,8	15,5	14,0	12,3	9,1
120/5		1,1	SM80BG/311 PE	1,28	4,10	2,37	0,40	31,9			28,2	27,0	25,7	24,1	22,4	20,5	17,1

PUMP TYPE CEA.. CIE..	VERSION	MOTOR P_N kW	MOTOR TYPE	ELECTRIC PUMP * P_1 kW	ELECTRIC PUMP * I 220-240 V A	ELECTRIC PUMP * I 380-415 V A	≥ MEI (1)	Q = DELIVERY l/min 0	120	140	160	180	200	250	300	301	302
								m^3/h 0	7,2	8,4	9,6	10,8	12,0	15,0	18,0	18,1	18,1
								H = TOTAL HEAD IN METRES OF COLUMN OF WATER									
210/2	1 ~	1,1	SM80BG/1115	1,11	4,91	-	0,40	17,9	16,9	16,5	16,1	15,6	15,0	14,4	13,7	12,9	11,1
210/3		1,1	SM80BG/1115	1,37	6,09	-	0,40	20,7	19,6	19,3	18,9	18,4	17,9	17,3	16,7	15,9	14,2
210/4		1,5	PLM90CEA-C0/1155 E2	1,81	8,23	-	0,40	25,6	24,9	24,5	24,1	23,7	23,1	22,4	21,7	20,9	19,1
210/2	3 ~	0,75	SM80BG/307 PE	1,04	3,22	1,86	0,40	17,7	16,5	16,1	15,6	15,1	14,4	13,8	13,0	12,2	10,4
210/3		1,1	SM80BG/311 PE	1,35	4,24	2,45	0,40	20,8	19,7	19,4	19,0	18,6	18,0	17,5	16,8	16,1	14,4
210/4		1,5	SM80BG/315 PE	1,73	5,46	3,15	0,40	25,6	24,8	24,5	24,1	23,6	23,0	22,4	21,6	20,8	19,0
210/5		2,2	PLM90BG/322 E3	2,20	7,35	4,24	0,40	29,0	28,2	27,9	27,5	27,1	26,6	26,0	25,4	24,7	23,1

PUMP TYPE CEA.. CIE..	VERSION	MOTOR P_N kW	MOTOR TYPE	ELECTRIC PUMP * P_1 kW	ELECTRIC PUMP * I 220-240 V A	ELECTRIC PUMP * I 380-415 V A	≥ MEI (1)	Q = DELIVERY l/min 0	180	200	250	300	350	400	430	480	520
								m^3/h 0	10,8	12,0	15,0	18,0	21,0	24,0	25,8	28,8	31,2
								H = TOTAL HEAD IN METRES OF COLUMN OF WATER									
370/1	1 ~	1,1	SM80BG/1115	1,43	6,32	-	0,40	16,3	15,5	14,7	13,7	12,4	10,9	9,1			
370/2		1,5	PLM90CEA-C0/1155 E2	1,95	8,87	-	0,40	20,4		18,8	17,9	16,9	15,6	14,1	12,3		
370/1	3 ~	1,1	SM80BG/311 PE	1,40	4,35	2,51	0,40	16,3	15,5	14,8	13,8	12,6	11,0	9,2			
370/2		1,5	SM80BG/315 PE	1,95	5,94	3,43	0,40	20,4		18,7	17,9	16,8	15,5	13,9	12,1		
370/3		2,2	PLM90BG/322 E3	2,45	7,84	4,53	0,40	24,4		22,5	21,7	20,7	19,5	18,1	16,3	14,3	13,0
370/5		3	PLM90BG/330 E3	3,26	10,10	5,86	0,40	30,3		27,9	27,1	26,2	25,0	23,6	22,0	20,2	19,0

Hydraulic performances in compliance withi ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A) (1) Minimum efficiency index MEI cea-cie_2p50-en_b_th

* Maximum value in specified range: P1 = input power; I = input current.

ACCESSORIES

Part No.	Description
Protector Mobile - Complete Units	
SF01F0028	PROTECTOR P10 MOBILE
SF01F0007	PROTECTOR P40 MOBILE SIZE 1, AISI 304
SF01F0008	PROTECTOR P40 MOBILE SIZE 2, AISI 304
Protector Mobile - Filter Screens & Bags	
AMCRT0104	2 LAYER INOX SS MICRON FILTER SIZE 11, 40µm
CABAG0001	FELT BAG PES SIZE 02 Ø 178 x L 813 mm 1µm
CABAG0002	FELT BAG PES SIZE 02 Ø 178 x L 813 mm 5µm
CABAG0003	FELT BAG PES SIZE 02 Ø 178 x L 813 mm 10µm
CABAG0004	FELT BAG PES SIZE 02 Ø 178 x L 813 mm 25µm
Protector Mobile - Spare Parts	
CDGRN0005	HOUSING GASKET Ø273 (EPDM)
CDGRN0020	BAG HOLDER GASKET (EPDM)
CASCM0015	AIR VENT - CALEFFI 1/2" F
100078	ANALOG INDICATOR
101563	ANODE SET (3) - PROTECTOR P40
101564	ANODE SET (3) - PROTECTOR P10

IWTM
water by design

Environmental Culture Change

be a part of it

clean | protect | prevent

LETTER OF COMPLIANCE

CLEAN MARITIME
MACHINERY AND COMPONENTS

COMPLIANCE LETTER NO. 1

This is to certify that the

Water Treatment Units

with type designations

15, 25, 50, 75, 100, 260, 500, 800 and 1000L

Manufactured by

International Water Treatment Maritime AS

SLEMMESTAD, Norway

is found to comply with

Det Norske Veritas' Standards for Certification 2.17 (new), Standard for CLEAN Maritime Machinery and Components

HØVIK
June 4th 2003

for Morten Østby
Project Responsible

for Tor Jo Landheim
Project Manager

DET NORSKE VERITAS

Founded in 1992, IWTM have been working with chemical free water treatment using electrochemistry for over 30 years and have offices in Norway, UK, Finland, Sweden, Canada, USA and a worldwide presence in the Marine sector.

We have developed models specifically suited to the higher demands of the marine industry operating at higher pressures and higher temperatures.
The marine products are provided worldwide on the world's largest cruise ships working with the leading operators in this sector.

Having secured DNV approval in 2003, we are still the only chemical free water treatment manufacturer to have this certification and approval. DNV is a globally leading quality assurance and risk management company operating in more than 100 countries.

The IWTM Protector™ is our most recently developed product. The Protector range is now available to our land-based customers.

Version 4 : Nov 2024

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