

# TRANSMED system installation on the “Niolon”

Date: 27 june 2011

Version 0.1

## Contacts: Cell

Isabelle TAUPIER-LETAGE, [itaupier \(at\) ifremer.fr](mailto:itaupier@ifremer.fr) +33 494 304 913 (Chief scientist )

Gilles ROUGIER, [grougier\(at\)ifremer.fr](mailto:grougier@ifremer.fr), +33 494 304 951 (Engineer/TS)

Karim BERNARDET [bernardet\(at\)dt.insu.cnrs.fr](mailto:bernardet@dt.insu.cnrs.fr) +33 494 304 464(Engineer/Network)



27/06/2011



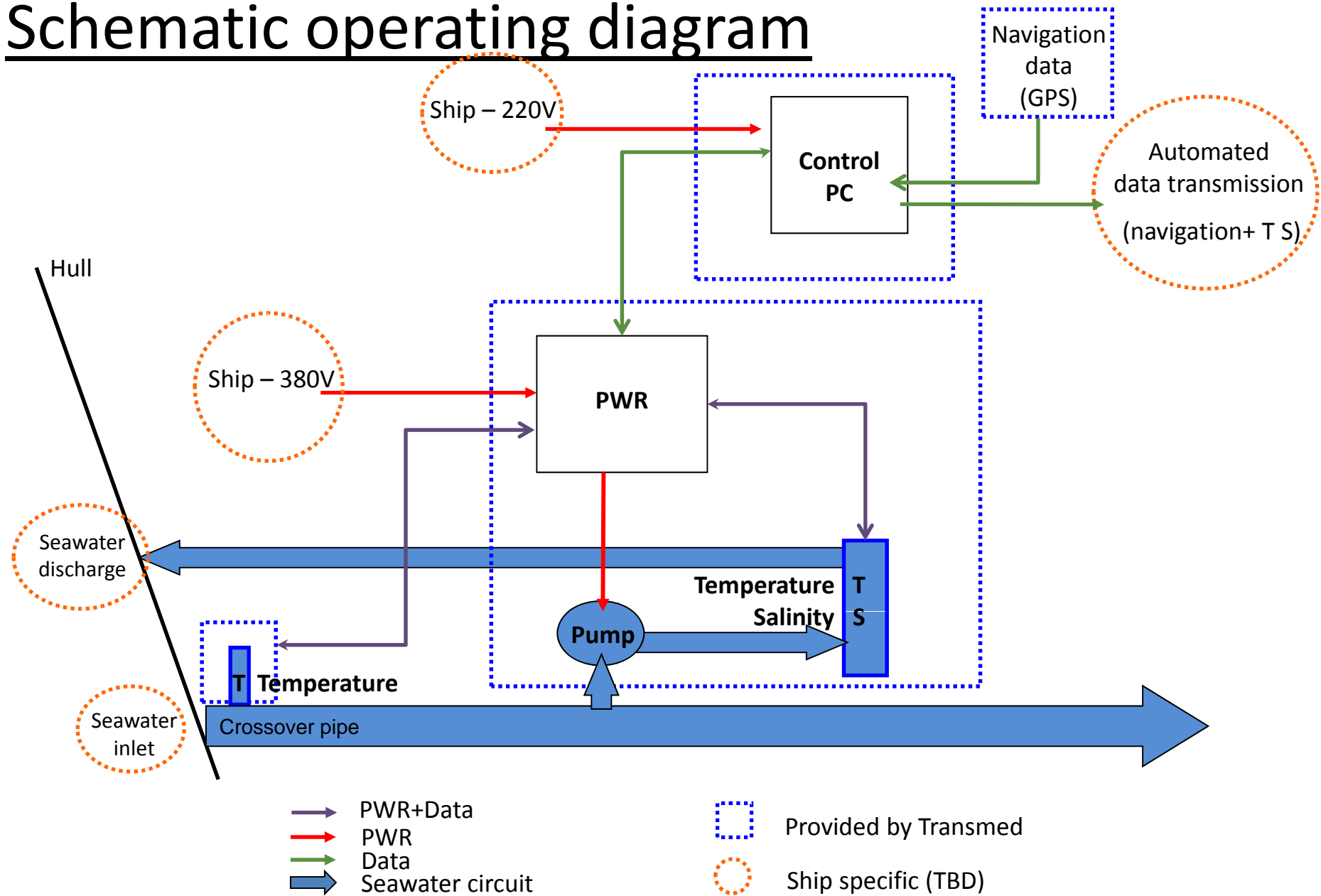
Division Technique UPS 855  
Institut National des Sciences de l'Univers Transmed



# TRANSMED system installation on the “Niolon”

- The TRANSMED system aims at measuring the surface (few meters below) **seawater temperature and salinity** autonomously and continuously while the ship is underway. Data are acquired ~every 15 seconds and averaged over ~1 minute. The 1-minute data are stored with the corresponding **latitude and longitude** information. **Data are transmitted** to data centers ashore within a few days (optimally in near-real time).
- A first temperature probe (**T**) is located as close to the water intake as possible to avoid modifying the seawater temperature. The seawater is pumped (**P**) from a crossover pipe and feeds the thermosalinograph (**TS**). The water is then discharged. A power supply chest (**PWR**) and a **PC** make the system run autonomously. T and TS data transmitted to the PC using the **ship’s Ethernet network**.
- Navigation data originate from our **GPS**, and are sent to **PC** via a RJ45 category 5 cable. TS data are transmitted ashore using the **ship’s Ethernet network** and **mailing facility** (TBD)

# Schematic operating diagram



# Plumbing

In red: elements provided by TRANSMED

- W12 - Input to valve V3
- V3 - Gate valve (to prevent return flow to TS and allow isolating TRANSMED circuit)
- W13 - Output from valve V3
- W14 - To discharge. Must be as close to the main discharge as possible (~0 pressure)

TS works continuously while underway

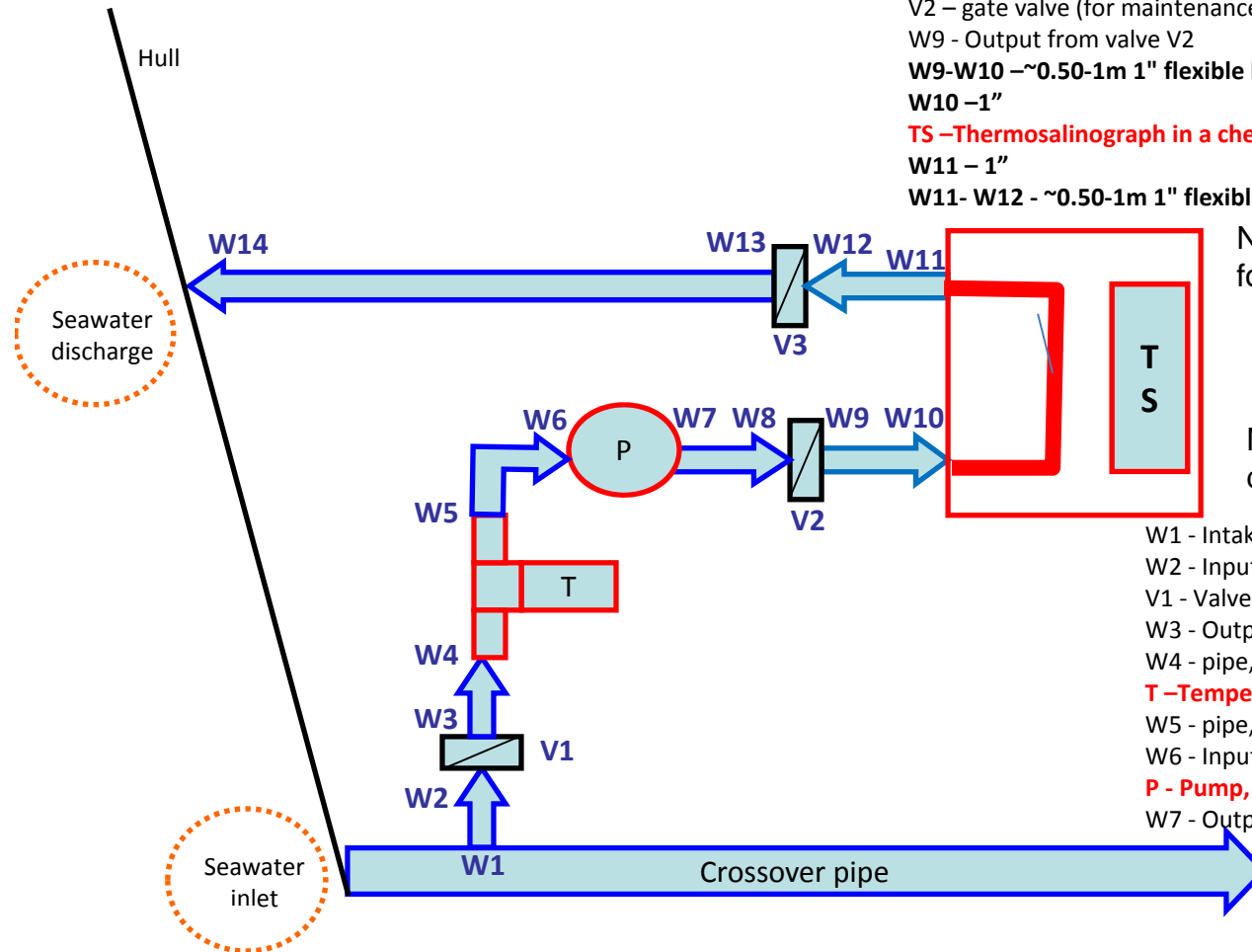
- W8 - Input to valve V2
- V2 - gate valve (for maintenance purposes)
- W9 - Output from valve V2
- W9-W10 - ~0.50-1m 1" flexible hose (will be disconnected for maintenance)
- W10 - 1"
- TS - Thermosalinograph in a chest (includes additional circuit)
- W11 - 1"
- W11- W12 - ~0.50-1m 1" flexible hose (will be disconnected for maintenance)

Note: TS must be by-passed for installation/maintenance

Recommended flow rate: 0.6 -1.8 l/min  
Operating pressure: < 3bars

NB: TS will not be provided in a chest due to space availability

- W1 - Intake in crossover pipe to feed TRANSMED circuit
- W2 - Input to valve V1
- V1 - Valve (to allow isolating TRANSMED circuit)
- W3 - Output from valve V1
- W4 - pipe, galvanized steel, 1" NPTx12", Nipple M-M, 304 SS, SCH40
- T - Temperature sensor: 2 pipes (W4 and W5) + plenum
- W5 - pipe, galvanized steel, 1" NPTx12", Nipple M-M, 304 SS, SCH40
- W6 - Input to pump, DNa 1"
- P - Pump, bronze, DNa 1" DNm 1" (NB: pump has a check-valve)
- W7 - Output from pump, DNm 1"



27/06/2011

TS Thermosalinograph  
T Temperature  
P Pump

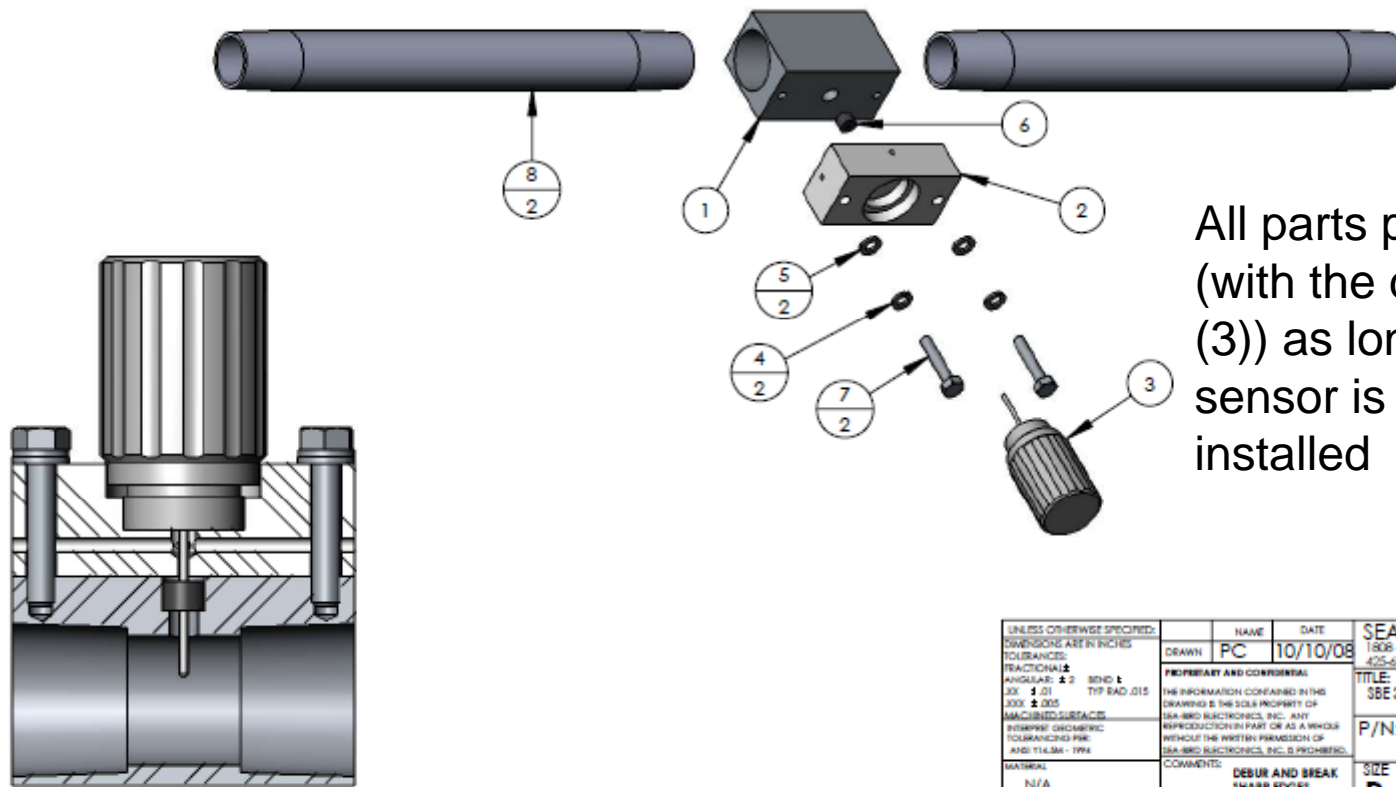
Transmed

V1-V3 gate Valves  
➡ SeaWater circuit W1-W14

ITEM NO.	PART NO.	DRAWING NO.	DESCRIPTION	QTY.
1	231580	21641	SBE38 Temperature Plenum	1
2	231581	21642	SBE38 Temperature Plenum Retainer	1
3	231582	21643	SBE38 Remote Temperature Plug	1
4	30254	N/A	Washer, 1/4 Split Ring Lock, SS	2
5	30570	N/A	Washer, 1/4" Flat, 960C416, SS	2
6	30809	21018D	Morrison Seal .047 ID x .41 OD Nitrile	1
7	31001	N/A	Bolt, 1/4-20 x 1 3/8 Hex Hd, SS	2
8	31263	N/A	Pipe, 1" NPT x 12", Nipple M-M, 304 SS, SCH40	2

DATE	REVISION	DESCRIPTION	AUTH	DR	CHK
10/10/08	.01	Converted to Solidworks	CB	PC	CB

### Mounting kit for T sensor



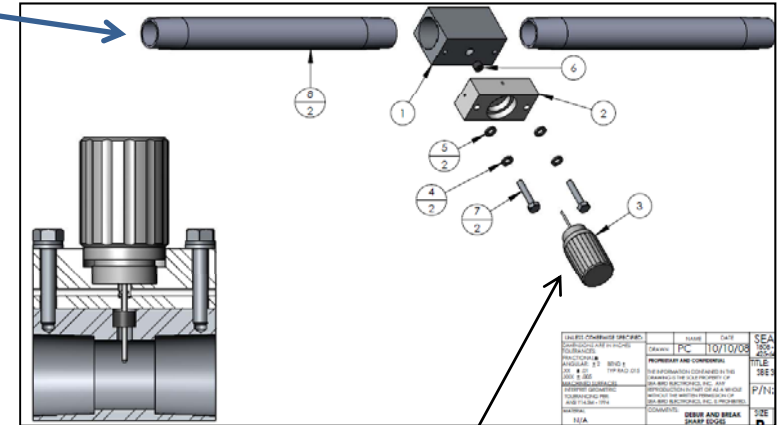
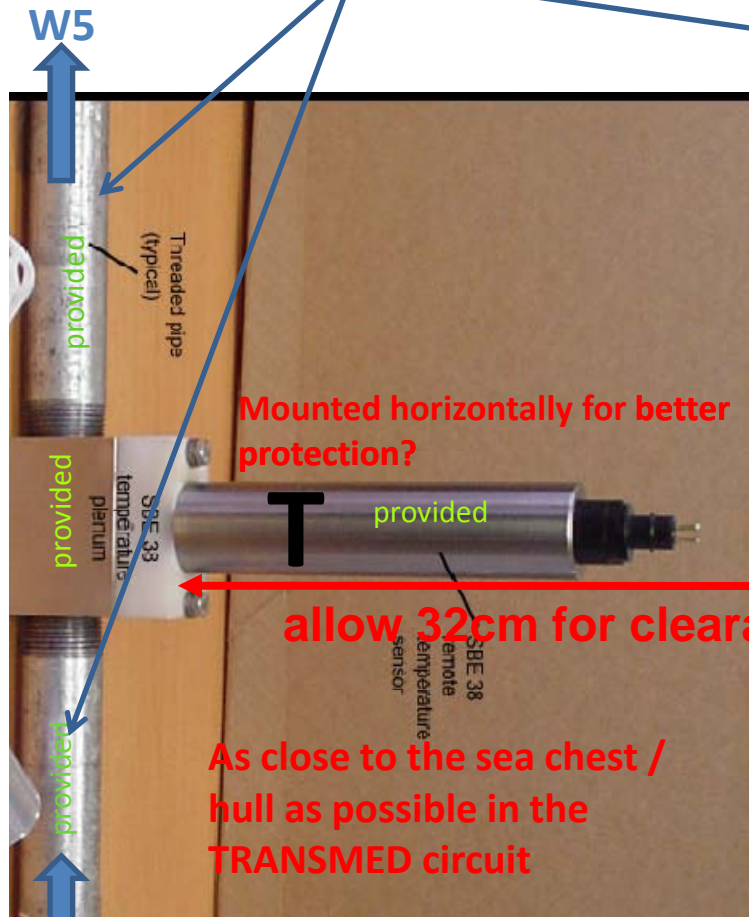
All parts provided (with the dummy plug (3)) as long as the T sensor is not installed

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ± ANGULAR: ±2 BEND ± DIA: ±.01 TYP RAD .015 HOLE: ±.005 MACHINED SURFACES: SURFACE: CIRCULAR TOLERANCING PER: ANSI Y14.5M - 1994	DRAWN: PC DATE: 10/10/08	SEA-BIRD ELECTRONICS, INC. 1808 - 136TH PLACE NE, BELLEVUE, WA 98005 425-643-8866
PROPERTY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SEA-BIRD ELECTRONICS, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SEA-BIRD ELECTRONICS, INC. IS PROHIBITED.	REV: .01	TITLE: SBE 38 External Temp Plenum Mount Assembly
MATERIAL: N/A	COMMENTS: DEBUR AND BREAK SHARP EDGES	P/N: 50244
FINISH: N/A	Old Part/Draw info N/A / N/A	SIZE: B DWG. NO.: 67071 REV: .01
DO NOT SCALE DRAWING		SCALE: 2:5 SHEET 1 OF 1

# T

W4 W5: pipe, galvanized steel, 1" NPTx12",  
Nipple M-M, 304 SS, SCH40

ITEM NO.	PART NO.	DRAWING NO.	DESCRIPTION	QTY.
1	231580	21641	SBE38 Temperature Plenum	1
2	231581	21642	SBE38 Temperature Plenum Retainer	1
3	231582	21643	SBE38 Remote Temperature Plug	1
4	30254	N/A	Washer, 1/4 Split Ring Lock, SS	2
5	30570	N/A	Washer, 1/4" Flat, 960C416, SS	2
6	30809	21018D	Morrison Seal .047 ID x .41 OD Nitrile	1
7	31001	N/A	Bolt, 1/4-20 x 1 3/8 Hex Hd, SS	2
8	31263	N/A	Pipe, 1" NPT x 12", Nipple M-M, 304 SS, SCH40	2



Since T is removed a plug is provided



# MicroTSG (Thermosalinograph)

# TS

## SBE 45

### SPECIFICATIONS

#### Measurement Range

Conductivity: 0-7 S/m (0-70 mS/cm)  
 Temperature \*: -5 to 35 °C

#### Initial Accuracy

Conductivity: 0.0003 S/m (0.003 mS/cm)  
 Temperature \*: 0.002 °C  
 Salinity: 0.005 PSU, typical

#### Typical Stability (per month)

Conductivity: 0.0003 S/m (0.003 mS/cm)  
 Temperature \*: 0.0002 °C  
 Salinity: 0.003 PSU, typical

#### Resolution

Conductivity: 0.00001 S/m (0.0001 mS/cm)  
 Temperature \*: 0.0001 °C  
 Salinity: 0.0002 PSU, typical

#### Calibration Range

Conductivity: 0-6 S/m (60 mS/cm); physical calibration 2.6-6 S/m (26-60 mS/cm), plus zero conductivity (air)  
 Temperature \*: +1 to +32 °C

#### Time Resolution

1 second

#### Clock Stability

13 seconds/month

#### Input Power

8-30 VDC

#### Acquisition Current

34 mA at 8 VDC; 30 mA at 12-30 VDC

#### Quiescent Current

10 microamps

#### Acquisition Rate

1 Hz maximum

#### Operating Pressure

34.5 decibars (50 psi) maximum

#### Flow Rate

10 to 30 ml/sec (0.16 to 0.48 gal/min)

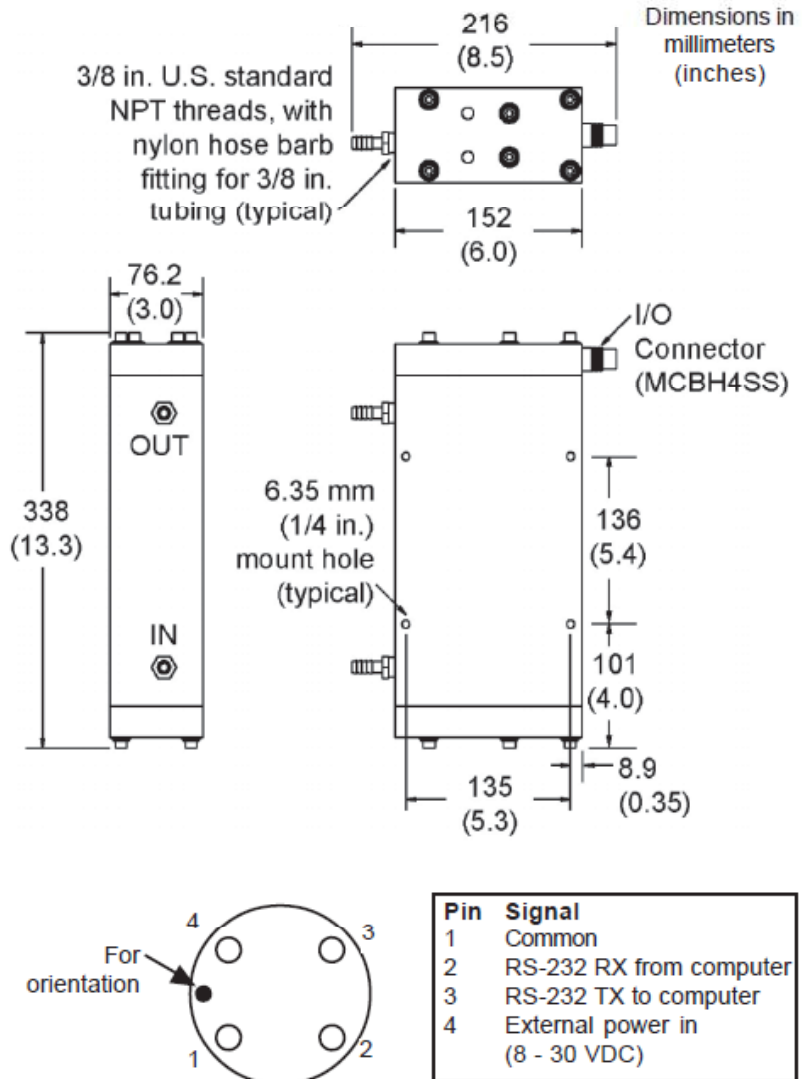
#### Materials

PVC housing

#### Weight

4.6 kg (10.2 lbs)

\* For specifications for optional SBE 38 remote temperature sensor, see SBE 38 datasheet.



The water supply to TS must not have bubbles  
 TS must not empty (even when stopped during calls)



# Pump (1/2):

"ACB"

SELF-PRIMING MOTOR PUMPS  
"ACB" SERIES  
With liquid ring



Gianneschi (<http://www.gianneschi.net>)  
Model: ACB90E

## APPLICAZIONI:

Esaurimento sentina, lavaggio catene, antincendio, travaso gasolio, alimentazione impianti, ecc

## COSTRUZIONE:

Corpo pompa: .....BRONZO  
Girante: .....LEGA SPECIALE DI OTTONE  
Albero: .....ACCIAIO INOX AISI 316  
Tenuta meccanica: DI ALTA QUALITÀ IN CERAMICA, GRAFITE INOX

## MOTORI:

Isolamento: .....Classe "F"  
Protezioni: ..... "IP 22" per C.C. ; "IP 44/55" per C.A.  
Voltaggi: ... V.12 ; 24 C.C. ; V.230M ; 230/400T C.A. 50 Hz

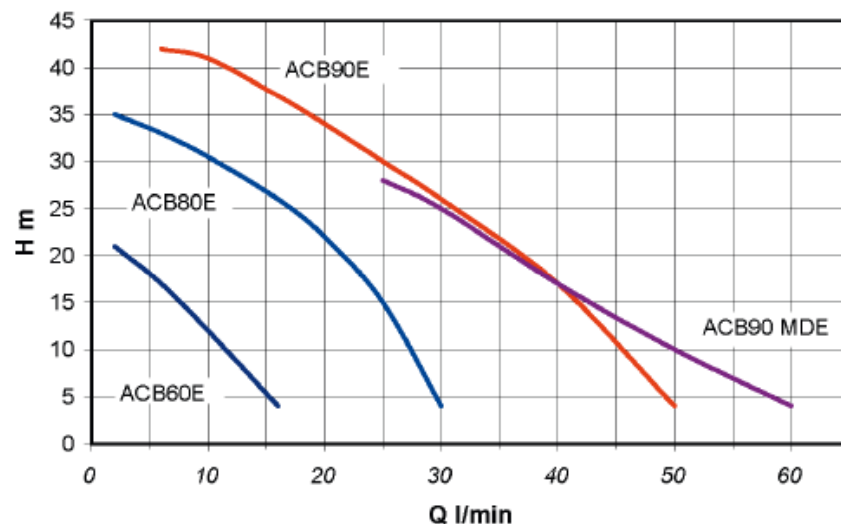
## GARANZIA:

Un anno (vedi condizioni generali di vendita)

## GENERALITÀ:

Le el/pompe autoadescanti serie "ACB", ad anello liquido con girante stellare, hanno una eccezionale capacità di autoaspirazione (fino a 9 m). Solo al primo avviamento, o dopo un lungo periodo di inutilizzo, si rende necessario il riempimento del corpo pompa, poi, si adescano automaticamente anche con il tubo di aspirazione vuoto. Si consiglia di installare sulla bocca di aspirazione un filtro ed una valvola a clapet.

## CORRENTE ALTERNATA - ALTERNATING CURRENT

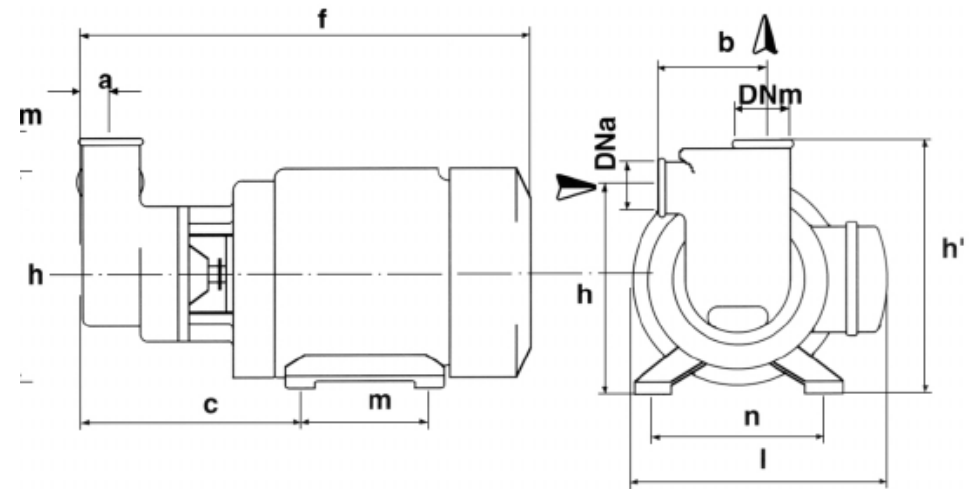
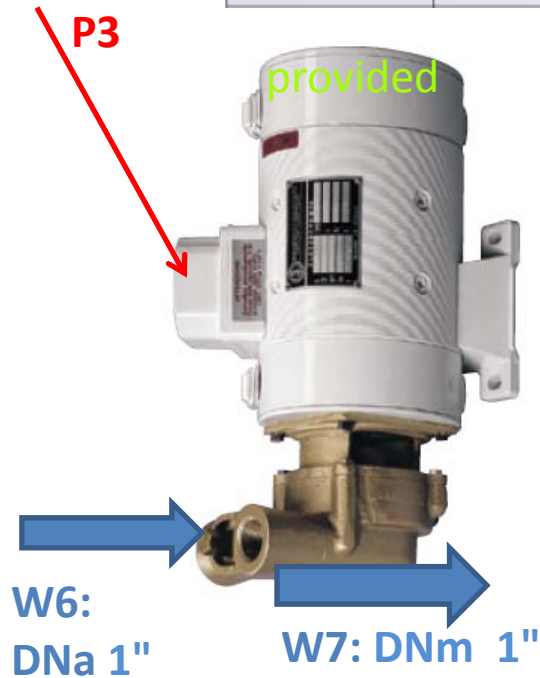




# Pump 2/2:

W6 - W7: bronze, 1"

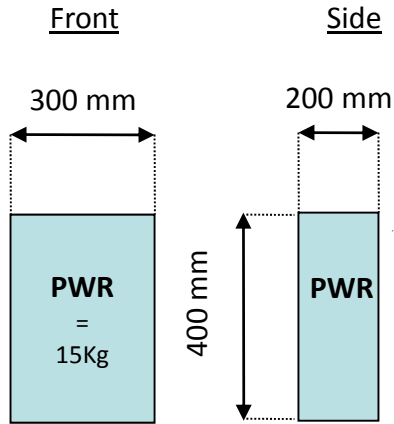
EL/POMPA EL/PUMP	POTENZA POWER  kW	ASS. ABS.  A	VOLTAGGIO VOLTAGE  V	GIRI/1' RPM  2900	PORTATA l/min					DELIVERY l/min				
					2	6	10	16	20	25	30	40	50	60
					PORTATA m <sup>3</sup> /h					DELIVERY m <sup>3</sup> /h				
					0.12	0.36	0.6	0.96	1.2	1.5	1.8	2.4	3	3.6
					PREVALENZA TOTALE mH <sub>2</sub> O					TOTAL MANOMETRIC HEAD mH <sub>2</sub> O				
ACB 90 E	0.45	-	230M+230/400T	2900		42	41	37	34	30	25	17	4	



ELETTROPOMPA EL/PUMP	f	h	h'	l	a	b	m	n	c	DNa	DNm	Kg	
ACB 90 E	c.a.-a.c.	312	142	183	175	26	85	90	112	154	1"	1"	14

# Dimensions

## Engine room / PWR chest



**PWR:** ~15kg

**Pump :** 12kg (see slide 9)

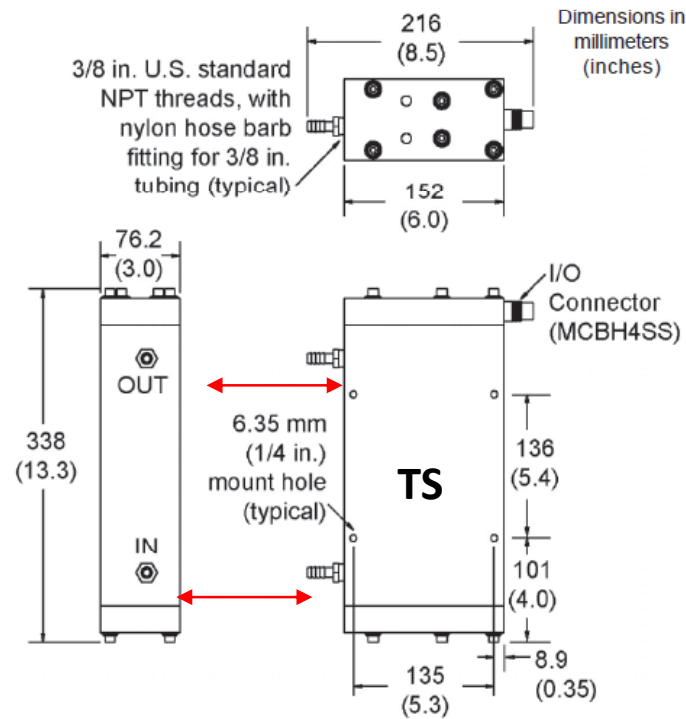
**T:** ~2kg

**TS:** ~5kg



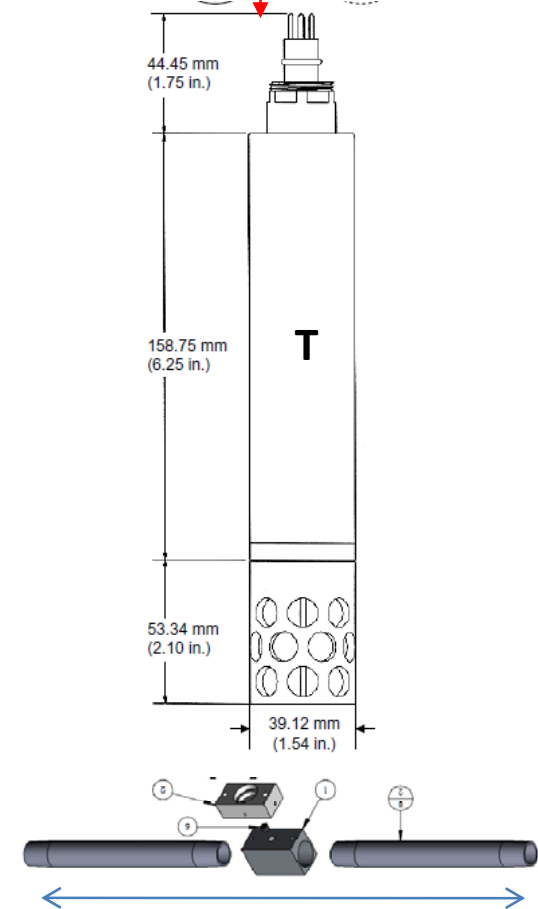
27/06/2011

## Engine room / TS



## Engine room / T

Allow clearance  
(at least 10cm)



Length after assembly: ~ 62 cm

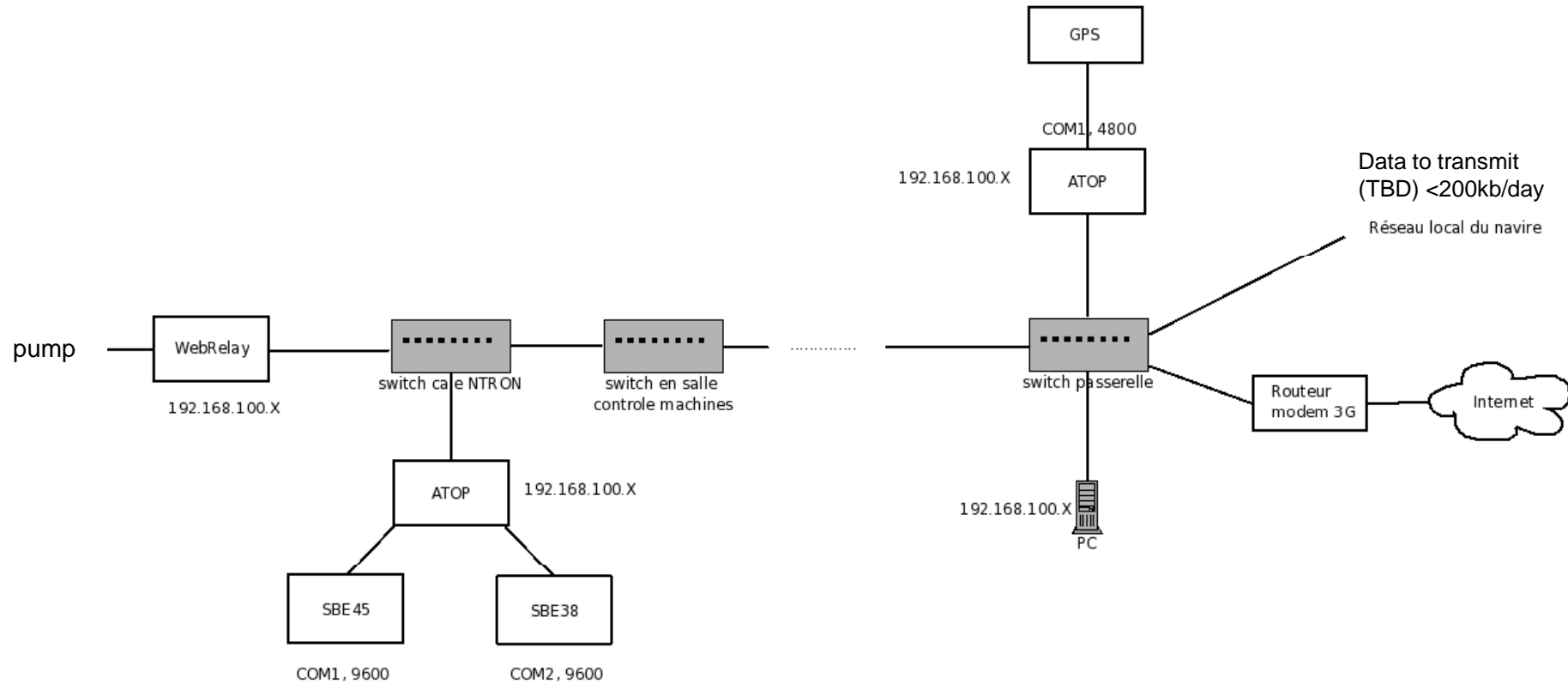
←→ Clearance !! (TBD)

Transmed

10

# Network (To be updated!)

ATOP = convertisseur série / IP



MISE A JOUR 27/06/2011