taconova

TACOFLOW3 MAX
TACOFLOW3 MAX PRO

CIRCULATION PUMPS FOR HEATING AND COOLING

INSTRUCTIONS FOR INSTALLATION AND USE

MKTG-TRA-MAN-E9135400-07/2019-ENG

CONTACT AND FURTHER INFORMATION TACONOVA.COM

Taconova Group AG | Neunbrunnenstrasse 40 | CH-8050 Zurigo | T +41 44 735 55 55 | F +41 44 735 55 02 | group@taconova.com | **taconova.com**
Taco Italia S.r.L. | Via Galileo Galilei, 89/91 | IT-36066 Sandrigo (VI) | T +39 0444 666800 | F +39 0444 666801 | info@tacoitalia.com | **tacoitalia.com**

INDEX

INTRODUCTION

Dear Customer,

first of all we would like to thank you for the confidence shown towards our company while purchasing your new “Circulator - Series TacoFlow3”.

We are confident that our product will meet your expectations, thanks to the reliability achieved with our constant focus on innovation processes and the technical and commercial transformations of markets.

Trusting to be able to meet also your future needs, we are happy to remain at your service and offer all our expertise and know-how to find the best solution for all your inquiries.

⚠ WARNING

IT IS FORBIDDEN TO USE THE CIRCULATOR BEFORE THE SIGNING OF THE FINAL TESTING AND COMMISSIONING CERTIFICATE.

1 MANUFACTURER

Name	TACO ITALIA SRL
Address	Via G. Galilei, 89-91 - 36066 Sandrigo (VI) Italy
Tel.	+39 0444 666800
Fax	+39 0444 666801
E-mail	info@tacoitalia.com
Website	www.tacoitalia.com

TAB. 1 *(Manufacturer)*

1.1 SUPPORT CENTERS

Contact the Manufacturer for the indication of any Support Center.

1.2 TECHNICAL SUPPORT REQUEST

Requests of support should be addressed directly to the Manufacturer specifying:
1) The designation of the circulator
2) The model of the circulator
3) The serial number (see CE marking and EU declaration of conformity)
4) Year of construction
5) Type of inconvenience encountered

2 RELEVANT INFORMATION

2.1 IDENTIFICATION OF THE MANUAL

This document is called the "Instruction Manual" (hereinafter "manual").

The manual is identified by the following data on the cover page and footer:

- Code of the "EN" Language.
- Wording: "Original instructions"
- ISO 7000 Symbol of the instruction manual (on the cover).
- Identification code.
- Issue.
- Revision.

2.2 INFORMATION ON THE MANUAL

⚠ CAUTION

THIS MANUAL SHALL ALWAYS BE AVAILABLE FOR THE AUTHORIZED OPERATORS AND SHALL ALWAYS BE CLOSE TO THE CIRCULATOR, WELL STORED AND PROTECTED.

IN CASE OF TRANSFER OF THE EQUIPMENT TO ANOTHER USER, IT IS COMPULSORY FOR THIS MANUAL TO BE HANDED OUT TOGETHER WITH THE CIRCULATOR.

IT IS RECOMMENDED TO COPY THE DOCUMENT IDENTIFICATION DATA: CODE, ISSUING DATE AND VERSION (SEE PAR. 2.1) TO BE ABLE TO REQUEST A COPY OF THE MANUAL TO THE MANUFACTURER IN CASE OF LOSS OR DETERIORATION.

THIS MANUAL COMPLIES WITH THE STATE OF THE ART OF TECHNOLOGY AT THE TIME OF THE TRADING OF THE CIRCULATOR AND SHALL NOT BE CONSIDERED INAPPROPRIATE ONLY BECAUSE IT MAY BE UPDATED LATER ON, DUE TO NEW EXPERIENCES.

⚠ CAUTION

BEFORE USING THE CIRCULATOR, IT IS COMPULSORY TO READ AND BE SURE THAT YOU HAVE FULLY UNDERSTOOD ALL PARTS OF THIS MANUAL.

THIS MANUAL IS AN INTEGRAL PART OF THE CIRCULATOR: KEEP IT FOR FUTURE REFERENCE.

FAILURE TO COMPLY WITH THE INSTRUCTIONS AND WARNINGS HEREIN CONTAINED RESULTS IN THE FORFEITURE OF THE WARRANTY.

THE MANUFACTURER SHALL NOT BE MADE LIABLE FOR ANY DAMAGES TO PEOPLE, ANIMALS AND/OR THINGS CAUSED BY THE NON OBSERVANCE OF THE INSTRUCTIONS AND WARNINGS DESCRIBED IN THIS MANUAL AND BY THE UNSUITABLE USE OF THE CIRCULATOR.

2.3 RECIPIENTS OF THE MANUAL

This manual is intended exclusively for the authorized operators entrusted with the use and maintenance of the circulator according to the specific technical-professional skills required by the type of works.

2.4 AUTHORIZED OPERATORS

⚠ WARNING

THE AUTHORIZED OPERATORS SHALL PERFORM ON THE CIRCULATOR EXCLUSIVELY THE INTERVENTIONS BELONGING TO THEIR SPECIFIC AREA OF COMPETENCE.

BEFORE PERFORMING ANY INTERVENTION ON THE CIRCULATOR, THE AUTHORIZED PEOPLE SHALL MAKE SURE TO BE IN SUCH A MENTAL AND PHYSICAL CONDITION AS TO ASSURE THE OBSERVANCE OF SAFETY CONDITIONS AT ANY TIME.

Symbol	Description of technical - professional competences
	ENTRUSTED OPERATOR He/she is a professionally trained operator who, in compliance with the laws in force in the country of use, is entitled to use the circulator and to perform only the following: • Checks and operations before starting (see par. 12.1); • startup (see par. 12.2); • stop (see par. 12.3) and restart after stop (see par. 12.4.1); • routine maintenance (see par. 14.2). All operations must be carried out in strict compliance with the instructions contained in this manual, by the operator equipped with personal protective equipment (PPE) required to in chap. 8.
	MECHANICAL AND HYDRAULIC MAINTENANCE TECHNICIAN This is a qualified technician authorized to perform exclusively works on mechanic and hydraulic parts in order to carry out adjustment, maintenance or repairing works, even with disabled protections (upon authorization by the Supervisor) in full compliance with the instructions contained in this manual or in any other specific document supplied exclusively by the Manufacturer and/or by the Assistance Center, being provided with the personal protective equipment (PPE) set forth by chap. 8.
	ELECTRIC MAINTENANCE TECHNICIAN This is a qualified technician (electrician meeting the technical and professional requirements required by the regulations in force), authorized to perform exclusively works on electric devices in order to carry out adjustment, maintenance or repairing works, even on live equipment and with disabled protections (upon authorization by the Supervisor) in full compliance with the instructions contained in this manual or in any other specific document supplied exclusively by the Manufacturer, being provided with the personal protective equipment (PPE) set forth by chap. 8.
	MANUFACTURER'S TECHNICIAN He is a qualified technician, made available by the Manufacturer and/or by the Assistance Center, which has specific knowledge of the circulator and is qualified to carry out the needed technical assistance, interventions of routine and extraordinary maintenance and/or operations not described in this manual, provided with the personal protective equipment (PPE) set forth by chap. 8.
	SUPERVISOR (person present and recognized only in the workplace) This is a person who, due to his/her professional skills and within the limits of hierarchical and functional powers suitable for the nature his/her role, supervises working activities and assures the implementation of received directions, checking that they are properly carried out by the workers and performing a functional initiative power.

TAB. 2 *(Authorized operators)*

2.5 READING HINTS

	Bold text: It highlights some meaningful sentences and references in the text.
	Generic or dedicated hazard sign: It highlights hazards for the health and safety of the operators and/or the risk of damaging the circulator or causing the malfunctioning of the same.
	Generic or dedicated mandatory sign: It indicates a prescription (obligation to perform an action).
	Generic or dedicated prohibition sign: It highlights the prohibition to perform an action.
	EX hazard warning sign: It highlights the risk due to explosion.
	Crossed-out wheeled bin: It highlights the prohibition to through away electric and electronic equipment (WEEE) in usual collection bins.
	Signal of obligation to read the manual: To use in safety conditions the circulator it is compulsory to read and understand all parts of this instructions manual and the technical documentation enclosed.
	Signal of obligation to disconnect the circulator before performing maintenance or repair: For safety operations on the circulator it is compulsory to place it in “safe state” (see par. 5.1).
	Signal of authorized operator: The symbol at the beginning of a chapter and/or paragraph indicates which operators are authorized (see par. 2.4) to perform the actions listed.

TAB. 3 *(Reading hints)*

⚠ DANGER

IT SIGNALS A HAZARD WITH A HIGH RISK LEVEL THAT MAY LEAD TO DEATH OR SEVERE INJURIES.

⚠ WARNING

IT SIGNALS A HAZARD WITH A MEDIUM RISK LEVEL THAT MAY LEAD TO DEATH OR SEVERE INJURIES.

⚠ CAUTION

IT SIGNALS A HAZARD WITH A LOW RISK LEVEL THAT MAY LEAD TO LIGHT OR NOT SEVERE INJURIES.

INFORMATION

IT HIGHLIGHTS ANY RELEVANT INFORMATION.

2.6 MAIN ABBREVIATIONS

ca.	Circa	par.	Paragraph
chap.	Chapter	Pos.	Position
PPE	Personal Protective Equipment	Q.ty	Quantity
R	Right	Ref.	Reference
etc.	Etcetera	L	Left
ex.	Example given	s	Seconds
FIG.	Figure(s)	TAB.	Table
h	hour(s)	s.	See
MAX.	Maximum	÷	From to
MIN.	Minimum	Ø	Diameter
min	Minutes	>	Greater than
mm	Diameter	≥	Greater than or equal to
NO.	Number	<	Less than
p.	Page	≤	Less than or equal to

TAB. 4 *(Main abbreviations)*

2.7 RESERVED RIGHTS

2.8 WARRANTY

The warranty covers construction and processing defects.
It is not applicable in the event of damage resulting from incorrect installation or defects in the design of the system, damage during transport or seizure due to residues of dirt inside the system. Proof of purchase is required to administer warranty claims.

3 IDENTIFICATION OF THE CIRCULATOR

3.1 NAME

The involved machine (hereinafter "Circulator") has the following name:

CIRCULATOR

3.2 SERIES

TacoFlow3

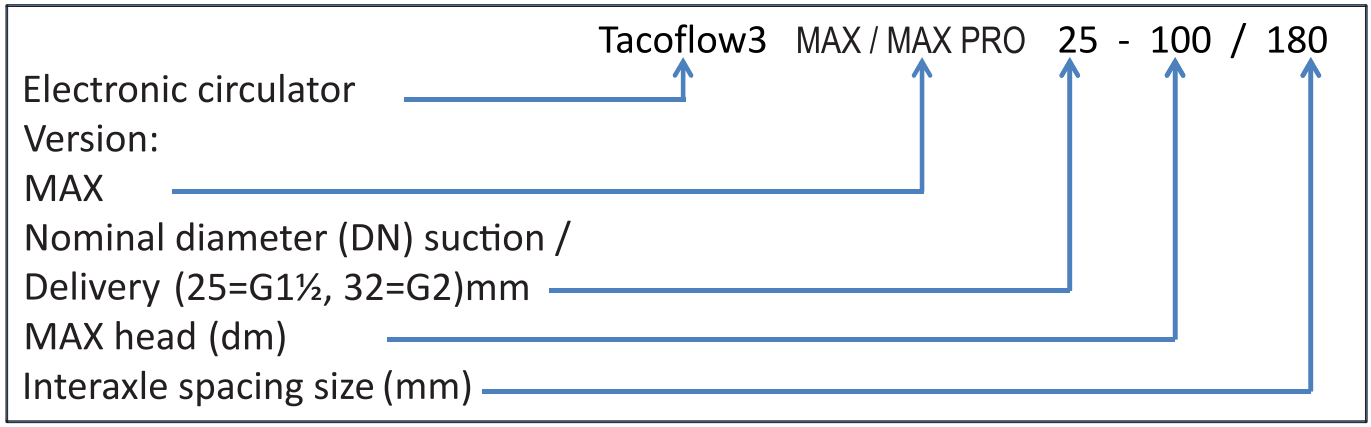
3.3 MODEL

MAX / MAX PRO

Characteristics					
Nominal diameter (DN) suction/delivery (mm)	MAX head (Dm)	Interaxle spacing (*) (mm)	Fitting	Electric connection	Communication
25	100	180	G 1 1/2	Plug&Play	PWM/0-10 V
	80				
	60				
32	100		G 2		
	80				
	60				
(*) Distance between the delivery and suction connection					

TAB. 5 *(Series/Model characteristics)*

Example:



4 CONFORMITY

4.1 DECLARATION OF CONFORMITY

Manufacturer Taco Comfort Solutions® A Taco Family Company	TACO ITALIA SRL Via G. Galilei, 89 - 91 - 36066 Sandrigo (VI) Italy Tel. +39 0444 666800 - Fax +39 0444 666801 info@tacoitalia.com - www.tacoitalia.com CE
Declares under its sole responsibility that the machine	
Name	CIRCULATOR
Series - Model	TacoFlow3 ☐ MAX ☐ MAX PRO
Serial number	|_|_|_|_|_|_|_|_|_|_|_|_|
Complies with the following Directives	
2014/35/EU	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (recast)
2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)
2011/65/EU	Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
2009/125/EC	Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products
2012/19/EU	Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)
Complies with the provisions of the following standards	
EN 60335-1:2012 (EN 60335-1:2012/AC:2014 - EN 60335-1:2012/A11:2014) EN 60335-2-51:2003 (EN 60335-2-51:2003/A1:2008 - EN 60335-2-51:2003/A2:2012) EN 55014-1; EN 55014-2; EN 61000-3-2; EN 61000-3-3; EN 62233:2008 (EN 62233:2008/AC:2008); EN 16297-1:2012; EN 16297-2:2012	
Person authorized to drawn up this Declaration	
Name and role	Luca Bolcati - General Manager and Managing Director
Place	Sandrigo (VI) Italy Date 02 / 09 / 19 Signature .....

4.2 DATA PLATE AND CE MARKING

The data plate and CE marking are applied externally to the circulator according to the Directives indicated in the EU declaration of conformity.

⚠ CAUTION

MAKE SURE, WHEN PURCHASING, THAT THE CIRCULATOR IS PROVIDED WITH THE DATA PLATE AND CE MARKING. IF THIS IS NOT THE CASE, IMMEDIATELY NOTIFY THE MANUFACTURER OR SUPPORT CENTER.

THE CIRCULATOR WITHOUT A NAMEPLATE AND CE MARKING IS NOT COMPLIANT AND THEREFORE SHOULD NOT BE USED.

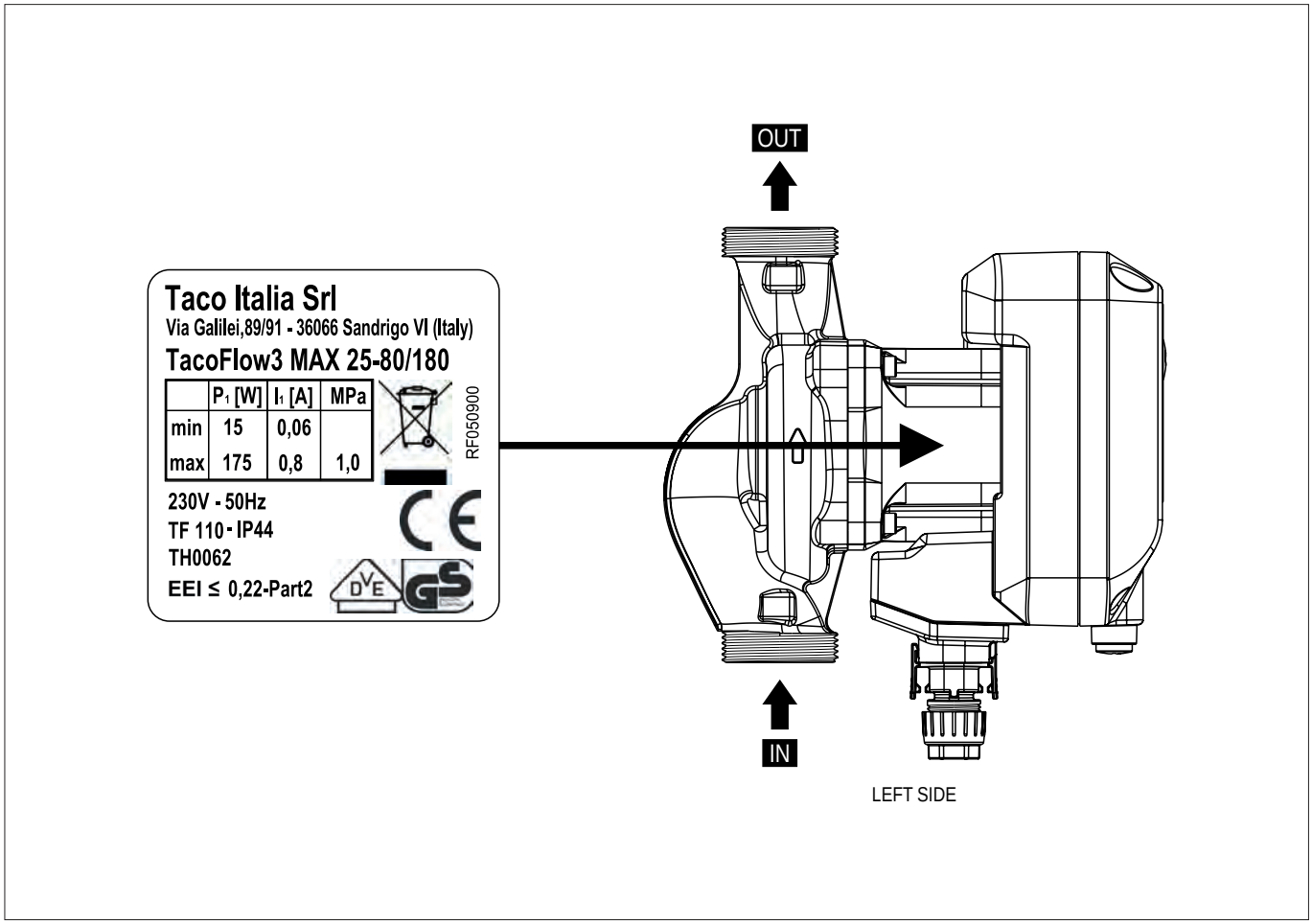


FIG. 1 *(Data plate and CE marking)*

5 DESCRIPTION OF THE CIRCULATOR

The circulator has a wet rotor with an integrated electronic frequency converter (INVERTER).
The circulator combines an advanced hydraulic system, a high-efficiency motor, intuitive control electronics and operating software that allow it to adapt perfectly to the various operating conditions and the actual needs of the plant.
The motor including the electronic adjustment module is mounted on the pump body by four screws. Depending on the set operating mode, the differential pressure follows different criteria.
In all regulation modes, the circulator adapts to the different loads of the system.

5.1 SAFETY STATE OF THE CIRCULATOR

The circulator is in "safety state" when it is isolated from the power supply sources, the residual energy has been dissipated and no conditions that could compromise the general state of safety are detected.
To place the circulator in "safety state" proceed as follows:
1) Stop the circulator bringing the main electric switch (by the Customer) into Pos. "0" or by disconnecting the plug from the electrical socket.
2) Close the valves of the plant downstream and upstream of the circulator.
3) Wait for the circulator to cool down.

5.2 INTENDED USE

Field of use	Civil and/or industrial heating systems
Place of use	The circulator must be placed inside, in a sufficiently illuminated and ventilated place protected from the weather, suitable for the laws in force in the country of use regarding safety
Intended use	Water/liquid circulation of water heating systems by hot water, air conditioning and renewable solar thermal energy systems for residential and commercial buildings such as, for example: • Residential buildings and condominiums • Public buildings • Hotels and restaurants / professional kitchens • Schools and gyms / sports facilities • Offices, craft and industrial buildings
Pumped liquids	Clean, non-aggressive and non-explosive liquids, not containing solid particles, fibers or mineral oils. In heating systems: water according to VDI 2035, water and glycol mixtures with percentages not exceeding 30%

TAB. 6 *(Intended use)*

⚠ WARNING
THE DEVICE CAN BE USED BY CHILDREN AGED MORE THAN 8 AND BY PERSONS WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPACITIES, OR LACKING IN EXPERIENCE OR THE NECESSARY KNOWLEDGE, PROVIDED THEY ARE UNDER SURVEILLANCE OR AFTER THEY HAVE RECEIVED INSTRUCTIONS RELATING TO SAFE USE OF THE APPLIANCE AND UNDERSTANDING OF THE DANGERS INHERENT IN IT. CHILDREN MUST NOT PLAY WITH THE APPLIANCE. CLEANING AND MAINTENANCE DESIGNED TO BE CARRIED OUT BY THE USER MUST NOT BE CARRIED OUT BY CHILDREN WITHOUT SUPERVISION.

5.3 REASONABLY FORESEEABLE IMPROPER USE

The circulator was designed and manufactured exclusively for the use set forth in par. 5.2, therefore it is absolutely forbidden any other type of application and use, in order to ensure at any time the safety of the authorized operators and the efficiency of the machine.

⚠ DANGER

IT IS FORBIDDEN THE COMMISSIONING OF THE CIRCULATOR IN ENVIRONMENTS WITH POTENTIALLY EXPLOSIVE ATMOSPHERE AND/OR IN PRESENCE OF COMBUSTIBLE DUST (ES: WOOD POWDER, FLOUR, SUGAR AND GRAINS).

⚠ DANGER

1) IT IS STRICTLY FORBIDDEN TO USE THE CIRCULATOR FOR IMPROPER USES, DIFFERENT FROM THE INTENDED USE SET FORTH BY THE MANUFACTURER (SEE PAR. 5.2).
2) IT IS FORBIDDEN THE CIRCULATOR USE BY PERSONS NOT AUTHORIZED (SEE PAR. 2.4) OR NOT IN POSSESSION OF FULL PSYCHO-PHYSICAL CAPACITIES.
3) IT IS FORBIDDEN TO USE THE CIRCULATOR WITHOUT THE GUARDS AND PROTECTIVE DEVICES OR FITTED WITH INEFFECTIVE GUARDS AND DEVICES.
4) IT IS FORBIDDEN TO NEUTRALIZE, TAMPER WITH, MANIPULATE OR EVADE THE GUARDS AND PROTECTION DEVICES INSTALLED IN THE CIRCULATOR.
5) IT IS FORBIDDEN TO USE THE CIRCULATOR FOR PUMPING LIQUIDS OTHER THAN THOSE SUITABLE FOR PUMPING (SEE PAR. 5.8).
6) IT IS FORBIDDEN TO USE THE CIRCULATOR ON REFRIGERATION SYSTEMS OR SIMILAR SYSTEMS.
7) USE OF THE CIRCULATOR IN DRY CONDITIONS IS PROHIBITED.
8) IT IS FORBIDDEN TO HANDLE THE CIRCULATOR BY HOLDING IT AGAINST THE HEAT SINK, IT MAY CAUSE DAMAGE TO THE ELECTRONIC BOARD.

⚠ WARNING

1) IT IS FORBIDDEN ANY CHANGE OF THE CIRCULATOR, THIS WILL VOID THE WARRANTY.
2) IT IS FORBIDDEN TO INSTALL ON THE CIRCULATOR TOOLS, ACCESSORIES AND/OR PARTS THAT ARE NOT ORIGINAL.
3) IT IS FORBIDDEN THE USE OF PRODUCTS DIFFERENT FROM THOSE INDICATED BY THE MANUFACTURER (SEE PAR. 5.8).
4) IT IS FORBIDDEN TO HANG ANY OBJECT ON THE CIRCULATOR.

INFORMATION

THE MANUFACTURER DECLINES ANY LIABILITY FOR DAMAGE TO PERSONS, PETS AND/OR THINGS CAUSED BY IMPROPER OR INCORRECT USE.

5.4 DIMENSIONS

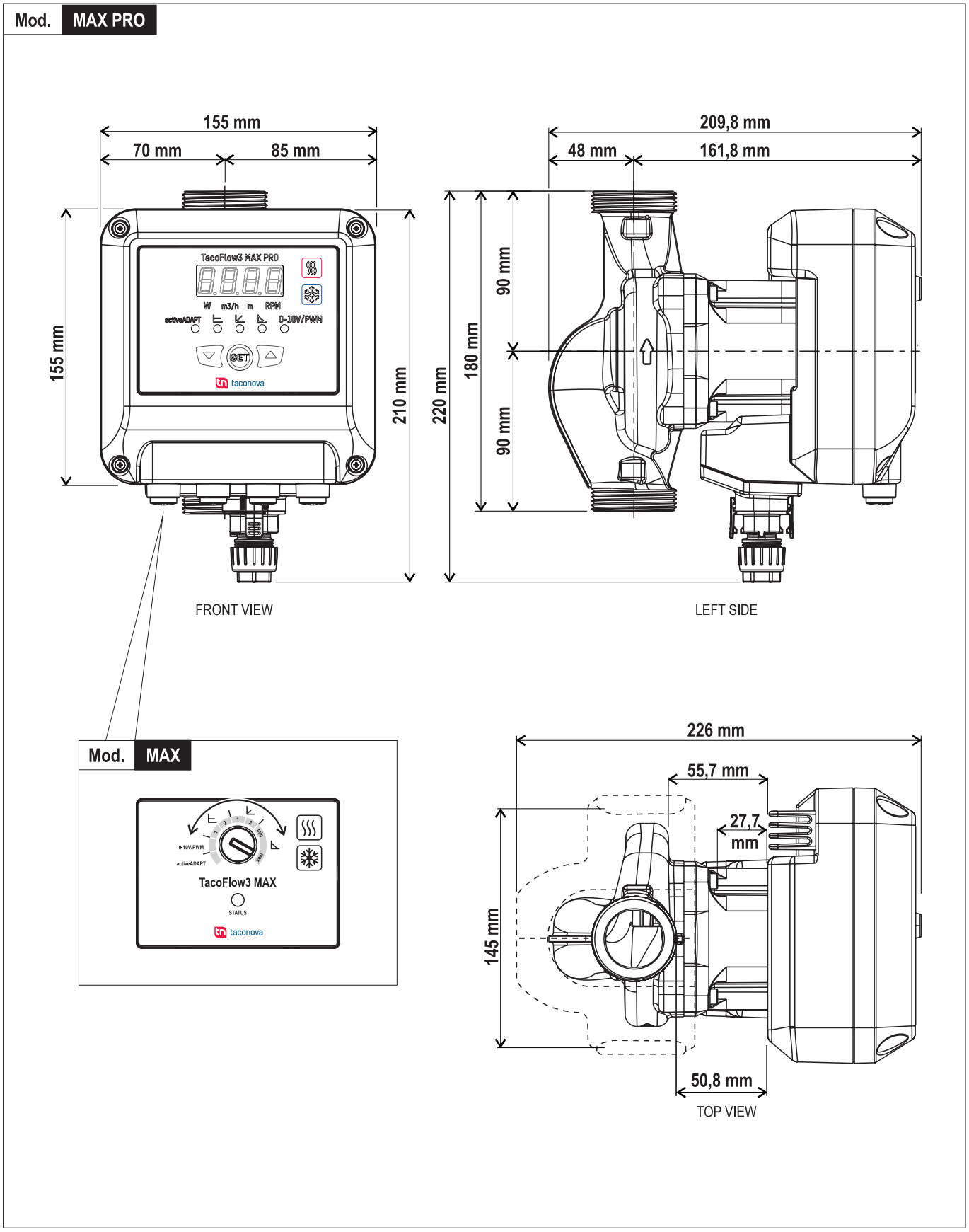


FIG. 2 *(Dimensions)*

5.5 USAGE LIMITS AND TECHNICAL DATA

Electric power supply	*VAC*	230
Power supply frequency	*Hz*	50
Insulation class		H
Degree of protection	*IP*	44
Class of the appliance		II
Ambient temperature (MIN. - MAX.)	*°C*	+0÷+40
Liquid temperature	*°C*	-10÷+110
Conditions of relative humility MAX.	*%*	≤ 95
MAX operating pressure	*bar / MPa*	10 / 1.0
Pressure on the suction mouth (1) with liquid temp. 50 °C	*bar / MPa*	0.3 / 0.03
Pressure on the suction mouth (1) with liquid temp. 95 °C	*bar / MPa*	1.0 / 0.10
Pressure on the suction mouth (1) with liquid temp. 110 °C	*bar / MPa*	1.5 / 0.15
IEE specific (2)	*IEE*	≤ 0.22
Mass	*kg*	3.5

(1) To avoid cavitation noise, the minimum pressures on the suction inlet must be scrupulously respected.
(2) The most efficient benchmark is IEE ≤ 0.20

TAB. 7 *(Usage Limits and technical data)*

5.6 ENERGY SOURCES

The machine is powered by the following power sources:
Single-phase electric current 230 VAC – 50 Hz.

5.7 EMISSIONS

5.7.1 SOUND PRESSURE

The maximum sound pressure level emitted by the pump in operation is <43 dB(A).

5.8 LIQUIDS SUITABLE FOR PUMPING

Type of liquids	Characteristics
Liquids	Clean, non-aggressive, non-explosive, free of solid particles, fibers or mineral oils
Liquids in heating systems	Water according to VDI 2035 Mixture of water and glycol with percentages not exceeding 30%
Liquids for domestic hot water systems	Water with MAX hardness of 38 °d

TAB. 8 *(Liquids suitable for pumping)*

⚠ WARNING

IT IS FORBIDDEN THE USE OF LIQUIDS OTHER THAN THOSE SET FORTH BY THE MANUFACTURER.

⚠ WARNING

IT IS COMPULSORY FOR THE AUTHORIZED OPERATORS TO READ AND BE SURE TO FULLY UNDERSTAND IN ALL PARTS ANY SAFETY CARD PROVIDED BY THE MANUFACTURERS OF THE LIQUIDS IN USE.

5.9 TEMPERATURE OF USE

Room temperature (°C)	0	10	20	30	35	40
Liquid temperature MIN. ÷ MAX. (°C)	2÷110	10÷110	20÷110	30÷110	35÷90	40÷70

TAB. 9 *(Temperatures of use)*

5.10 NAME OF THE MAIN COMPONENTS

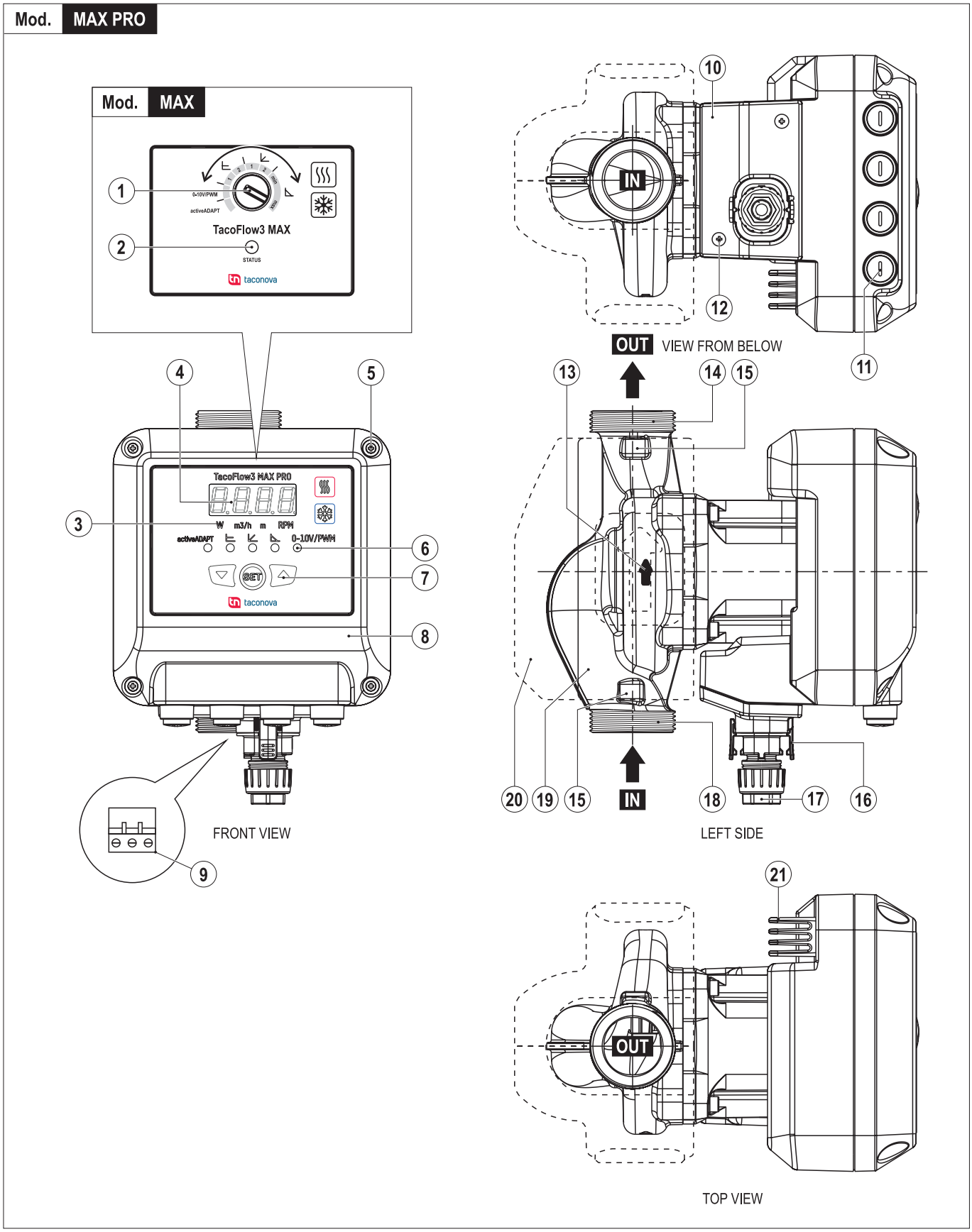


FIG. 3 *(Name of the main components)*

Ref.	Name	Main functions
1	Curves selector (Mod. MAX)	It selects the desired performance curve
2	LED indicator (Mod. MAX)	It indicates the various operating phases with different colors
3	Selected measurement LED (orange color)	ON indicates the selected measurement: • W = Absorbed electric power • m3/h = Estimated flow • m = Estimated head • RPM = Speed (n/rev)
4	Display (4 digits color green)	It displays the status of the pump and the value of the selected measurement
5	Power connection cover screws	They attach the lid to the container (N. 2 - M3x25 mm - 0.5 Nm ± 0.1 Nm)
6	Status LED	It indicates the operating status of the circulator (see par. 5.12.1)
7	Selection buttons DOWN - UP - “SET”	They select and confirm the desired value
8	Motor cover	It covers the electric motor
9	Electrical connector	It allows connection of the power supply cables
10	Power connection cover	It includes the plug & play connector
11	Signal output plugs	Signal output hole protection
12	Engine cover screws	They attach the lid to the container (ø3x25 mm - 1.05 Nm ± 0.15 Nm)
13	Arrow	It indicates the direction of rotation of the circulator and the direction of the liquid
14	Delivery connection	It allows the connection to the delivery pipe
15	Seats for wrench	It allows the insertion of the fixed wrench to perform fixing to the pipings
16	Quick connector	It connects the power cable to the circulator
17	Cable gland	It locks the power cord to the connector
18	Suction connection	It allows the connection to the suction pipe
19	Circulator body	It conveys the liquid
20	Insulating shells	They limit heat loss from the circulator body
21	Heat sink	It allows cooling of the electric motor

TAB. 10 *(Name of the main components)*

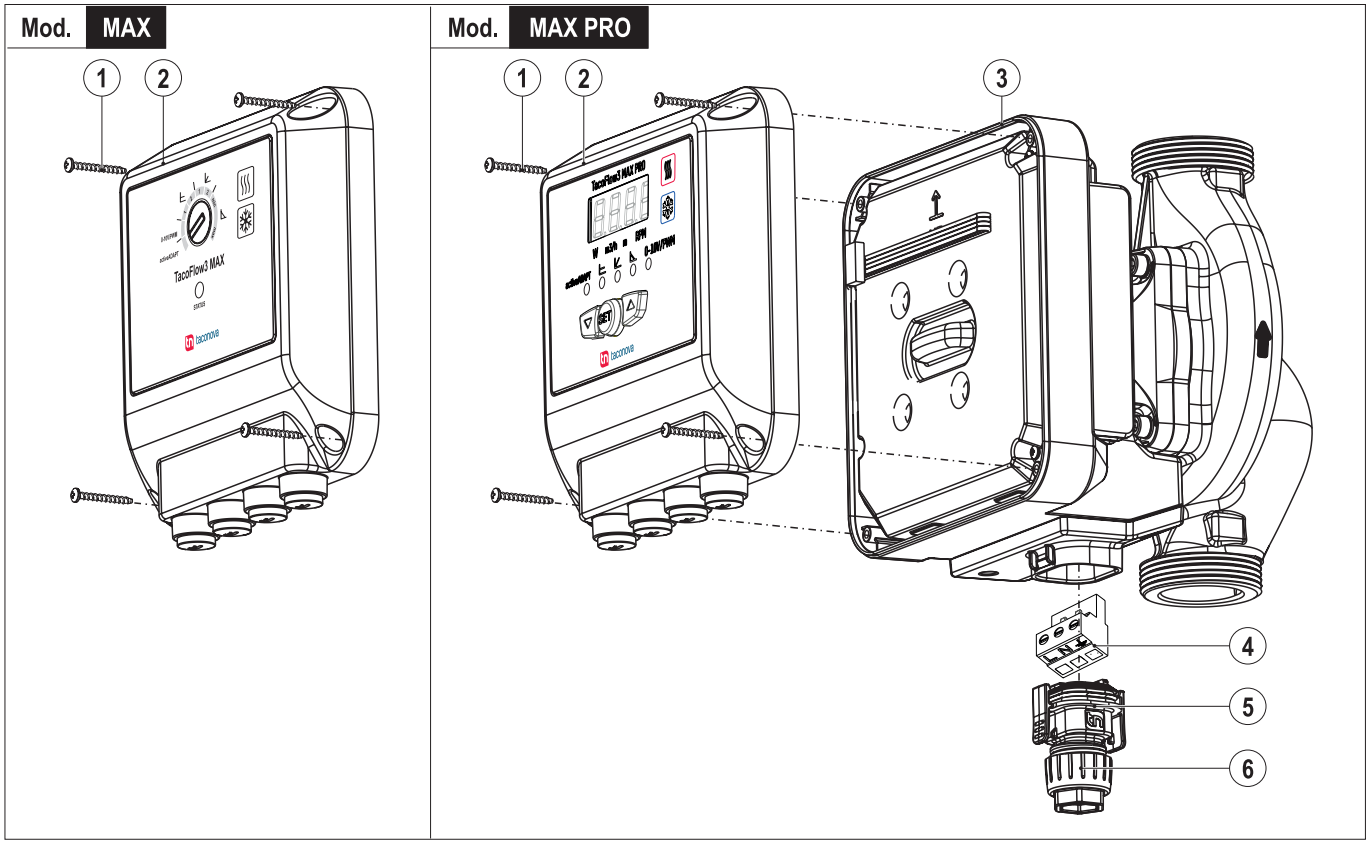


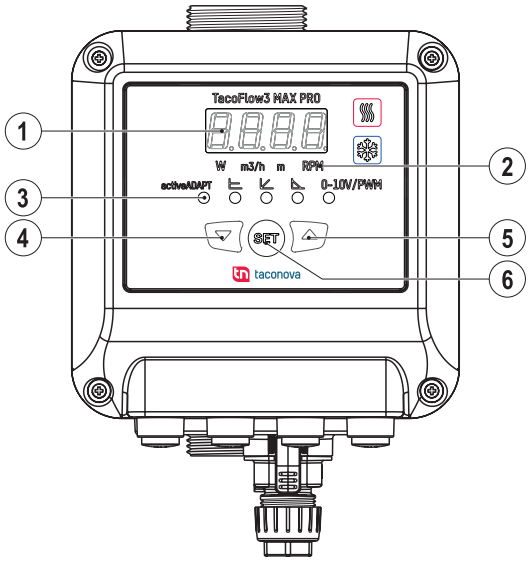
FIG. 4 *(Name of the main components)*

Ref.	Name	Main functions
1	Engine cover screws	They attach the lid to the container (N. 4 - 3x25 mm - 1.05 Nm ± 0.15 Nm)
2	Control shell group	It houses the circulator control board
3	Power shell group	It contains the electronic power board
4	Connector (L - N - ⏚)	It connects the electric cables
5	Quick connector	It connects the power cable to the circulator
6	Cable gland	It locks the power cord to the connector

TAB. 11 *(Name of the main components)*

5.11 CONTROL AND COMMAND DEVICE MAX PRO MOD.

Mod. **MAX PRO**



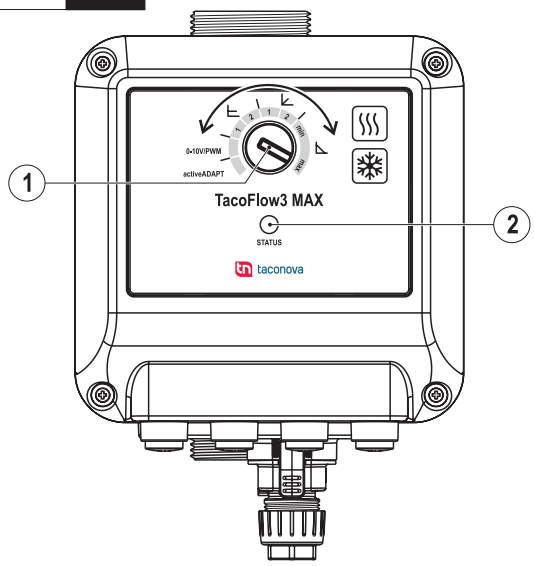
FRONT VIEW

Ref.	Name	Main functions
1	Display (4 digits color green)	It displays the status of the pump and the value of the selected measurement
2	Selected measurement LED (orange color)	ON indicates the selected measurement: • W = Absorbed electric power • m3/h = Estimated flow • m = Estimated head • RPM = Speed (n/rev)
3	Status LED	It indicates the operating status of the circulator (see par. 5.12.1)
4	"DOWN" button	They select the desired value
5	"UP" button	
6	"SET" Button	It confirms the desired value

TAB. 12 *(Control and command device MAX PRO mod.)*

5.12 CONTROL AND COMMAND DEVICE MOD. MAX

Mod. **MAX**



FRONT VIEW

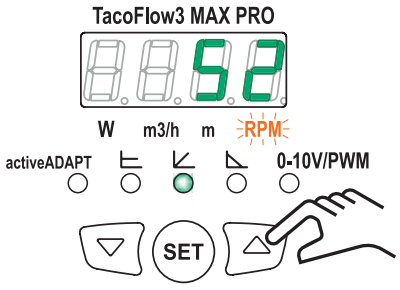
Ref.	Name	Main functions
1	Curves selector	It selects the desired performance curve (the selector rotates 270°).
2	LED indicator	• It indicates the operating status of the circulator (see par. 5.12.1)

TAB. 13 *(Control and command device mod. MAX)*

INFORMATION
THE GRAPHS OF THE PERFORMANCE/CONSUMPTION CURVES FOR EACH PUMP SIZE CAN BE FOUND ON THE WWW.TACONOVA.COM WEBSITE.

5.12.1 OPERATING MODE

LED	Color	Description
ActiveADAPT	Purple	The activeADAPT program allows the circulator to adapt its performance to the demands of the system during short control intervals within a defined adjustment area. • It improves the hydraulic balance of the system • It ensures optimum performance during partial load periods, e.g. at night • It enables quick configuration
C	Orange	Mode C - Constant pressure difference The circulator maintains a constant head (pressure), regardless of the heat demand from the system (flow rate)
P	Green	Mode P - Proportional pressure difference The hydraulic head (pressure) of the circulator is proportionally reduced as the demand for heat by the system decreases (reduction of the flow rate) and increases proportionally with the increase in the demand for heat by the system (increase in flow rate)
min-max	Blue	Min-max mode - Fixed speed The circulator maintains a fixed speed, regardless of the heat demand from the system (flow rate). The speed is adjusted by gradually positioning the selector at any point between the min and max positions. If the performances are insufficient, progressively increase the value or if noises due to the speed of the pumped fluid are established, gradually reduce the calibration
	Yellow	0-10V/PWM Analog signal output External pump setpoint
air	Slow flashing white	Automatic detection of the presence of air in the system. Vent the system
	Red	Alarm (see chap. 13)
MEASUREMENT SETTING (MAX PRO Mod.)		
“W”	Orange	Electric power absorbed
“m3/h”	Orange	Estimated flow
“m”	Orange	Estimated head
“RPM”	Orange	Speed (n/rev)



To select the desired measurement press the DOWN and UP buttons, the orange LED of the selected measurement will light up.

TAB. 14 *(Operating mode mod. MAX and MAX PRO)*

INFORMATION
TO SET THE OPERATING SPEED (SEE PAR. 12.2.2).

6 GUARDS AND PROTECTION DEVICES

6.1 NAME AND FUNCTIONS

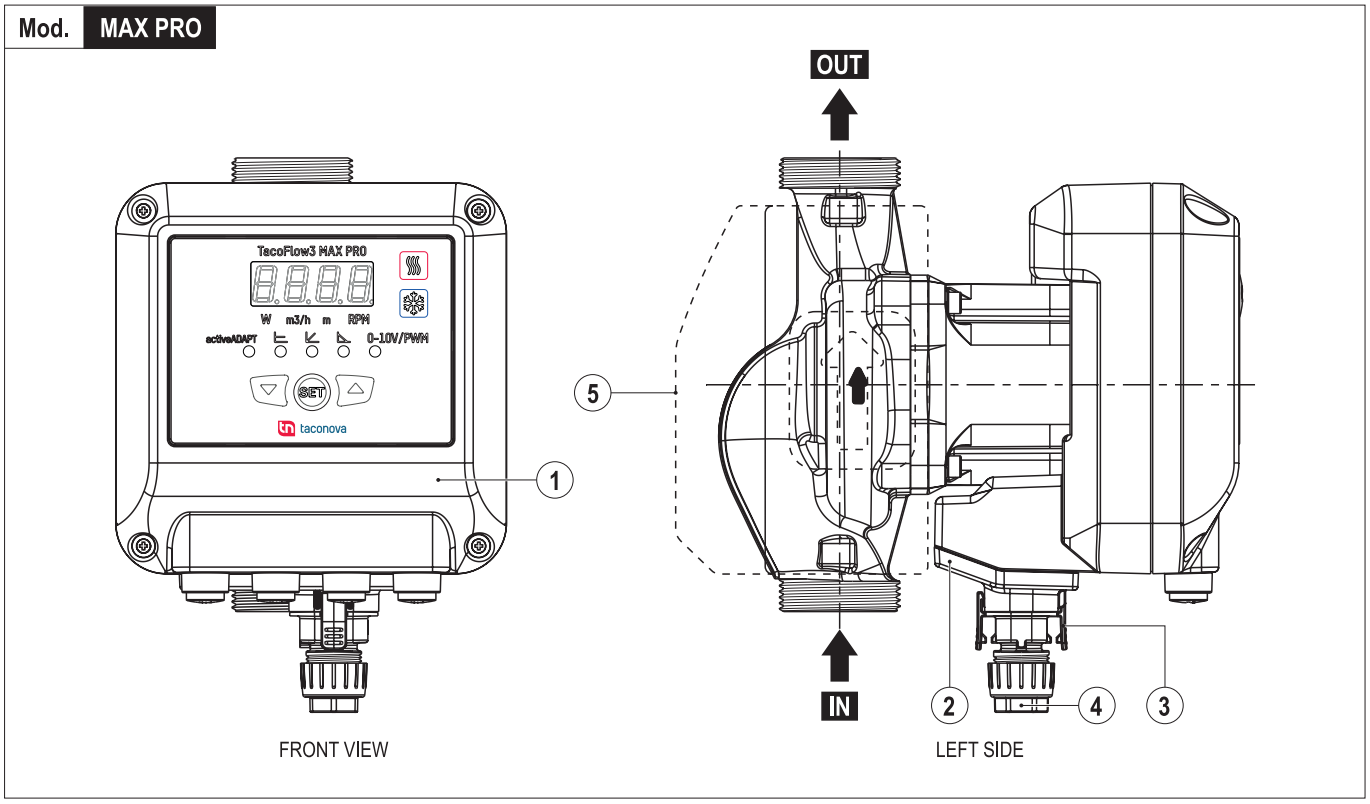


FIG. 5 *(Guards and protection devices)*

Ref.	Name	Main functions
1	Motor Cover	It covers the electric motor
2	Cover power connection	It includes the plug & play connector
3	Quick connector	It connects the power cable to the circulator
4	Cable gland	It locks the power cord to the connector
5	Insulating shells	They limit heat loss from the circulator body

TAB. 15 *(Guards and protection devices)*

⚠ DANGER

IT IS FORBIDDEN TO NEUTRALIZE, TAMPER WITH, MANIPULATE OR EVADE THE GUARDS AND PROTECTION DEVICES INSTALLED IN THE CIRCULATOR.

IT IS STRICTLY FORBIDDEN TO REPLACE ANY SAFETY DEVICE OR ANY OF ITS COMPONENTS WITH NON-ORIGINAL SPARE PARTS.

IT IS FORBIDDEN TO USE THE CIRCULATOR IN THE PRESENCE OF ANY TYPE OF ANOMALY.

⚠ WARNING

IT IS COMPULSORY TO CHECK AT ANY TIME THE PROPER FUNCTIONING OF ALL THE SAFETY DEVICES INSTALLED INTO THE CIRCULATOR.

IT IS MANDATORY TO PROMPTLY REPLACE ANY MALFUNCTIONING AND/OR DAMAGED SAFETY DEVICES.

IT IS MANDATORY TO REPORT ANY TYPE OF ANOMALY TO THE PERSON IN CHARGE AND WAIT FOR INSTRUCTIONS BEFORE USE.

INFORMATION

TO ORDER SPARE PARTS AND PROTECTIVE EQUIPMENT SEE CHAP. 16.

⚠ CAUTION

IT IS COMPULSORY TO PERIODICALLY CHECK THE INTEGRITY AND EFFECTIVENESS OF THE GUARDS AND PROTECTION DEVICES.

7 RESIDUAL RISKS

The authorized operator is hereby informed that the potential residual risks described below do persist, despite all technical and constructive measures implemented by the Manufacturer to make the circulator safe.

⚠ DANGER

IN ORDER TO MINIMIZE EXPOSURE TO RESIDUAL HAZARDS IT IS FORBIDDEN TO USE THE CIRCULATOR IN AN INCORRECT WAY OTHER THAN THE INTENDED USE BY THE MANUFACTURER (SEE PAR. 5.2).

IT IS COMPULSORY TO WEAR PERSONAL PROTECTIVE EQUIPMENT (SEE CHAP. 8) INDICATED IN THIS MANUAL.

RESIDUAL RISK NO. 1

THERE IS THE DANGER OF EJECTIONS CAUSED BY THE LEAKAGE OF LIQUID FROM THE FITTINGS IF THE AUTHORIZED OPERATORS USE THE CIRCULATOR IN AN INCORRECT WAY (SEE PAR. 5.2) AND DO NOT RESPECT THE FOLLOWING REQUIREMENTS:

- OBLIGATION TO WEAR THE PPE FORECAST (SEE CHAP. 8).
- OBLIGATION TO RESPECT THE PROCEDURES FOR A CORRECT USE AND MAINTENANCE.

RESIDUAL RISK NO. 2

THERE IS THE DANGER OF BURNS CAUSED BY ACCIDENTAL CONTACT WITH HOT SURFACES IF THE AUTHORIZED OPERATORS USE THE CIRCULATOR IN AN INCORRECT WAY (SEE PAR. 5.2) AND DO NOT RESPECT THE FOLLOWING REQUIREMENTS:

- OBLIGATION TO WEAR THE PPE FORECAST (SEE CHAP. 8).
- OBLIGATION TO RESPECT THE PROCEDURES FOR A CORRECT USE AND MAINTENANCE.

RESIDUAL RISK NO. 3

THERE IS THE DANGER OF ELECTROCUTION CAUSED BY ACCIDENTAL CONTACT WITH THE ELECTRIC CABLES, IF THE AUTHORIZED OPERATOR USES THE CIRCULATOR INCORRECTLY (SEE PAR. 5.2) AND DOES NOT RESPECT THE FOLLOWING REQUIREMENTS:

- OBLIGATION TO WEAR THE PPE FORECAST (SEE CHAP. 8).
- OBLIGATION TO RESPECT THE PROCEDURES FOR A CORRECT USE AND MAINTENANCE.

8 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The use of Personal Protective Equipment (PPE) is mandatory to comply with the Laws on occupational safety and health in force in the country of use of the circulator.
Both the employer and the authorized operators have to know and comply with the obligations and duties set forth by the above mentioned regulations.

Sign	PPE mandatory for all authorized operators
	Hand protection (protective gloves)
	Feet protection (anti-slipping footwear with reinforced toe)
	Body protection (protective clothing)
	Face protection (protective visor) if necessary

TAB. 16 *(Personal Protective Equipment - PPE)*

9 TRANSPORT AND HANDLING

Generally the circulator is transported to the customer by the Manufacturer by means of a "specialized shipping company", which, using its own personnel and means suitable for the use, shall take care of the loading, transport and unloading operations according to the involved type of transport (by land, by sea or by air).

9.1 PACKAGING AND PACKAGING CONTENTS

Generally the circulator is delivered assembled in a cardboard box.

Parts of the circulator	
No. 1 Circulator	No. 1 Connector (L - N - ⏚)
No. 2 Gaskets	No. 1 Instruction manual

TAB. 17 *(Packaging and packaging contents)*

9.2 UNPACKING

Proceed with unpacking as follows:
1) Open the package and extract the circulator.
2) Check the contents of the packaging (see par. 9.1).

INFORMATION

IF COMPONENTS OR ACCESSORIES ARE MISSING, CONTACT THE MANUFACTURER (SEE CHAP. 1).

IF THE COMPONENTS OF THE CIRCULATOR SHOW ANY DAMAGE OR ANOMALIES CONTACT THE MANUFACTURER AND DO NOT USE IT.

⚠ CAUTION

IT IS COMPULSORY TO DISPOSE OF THE PACKAGE ACCORDING TO THE DIFFERENT TYPES OF MATERIAL IN FULL RESPECT OF LAW IN FORCE IN THE COUNTRY OF USE.

⚠ DANGER

IT IS FORBIDDEN TO HANDLE THE CIRCULATOR HOLDING IT ON THE HEAT SINK (FIG. 6 - REF. 1): YOU MAY CAUSE DAMAGE TO THE ELECTRONIC CARD.

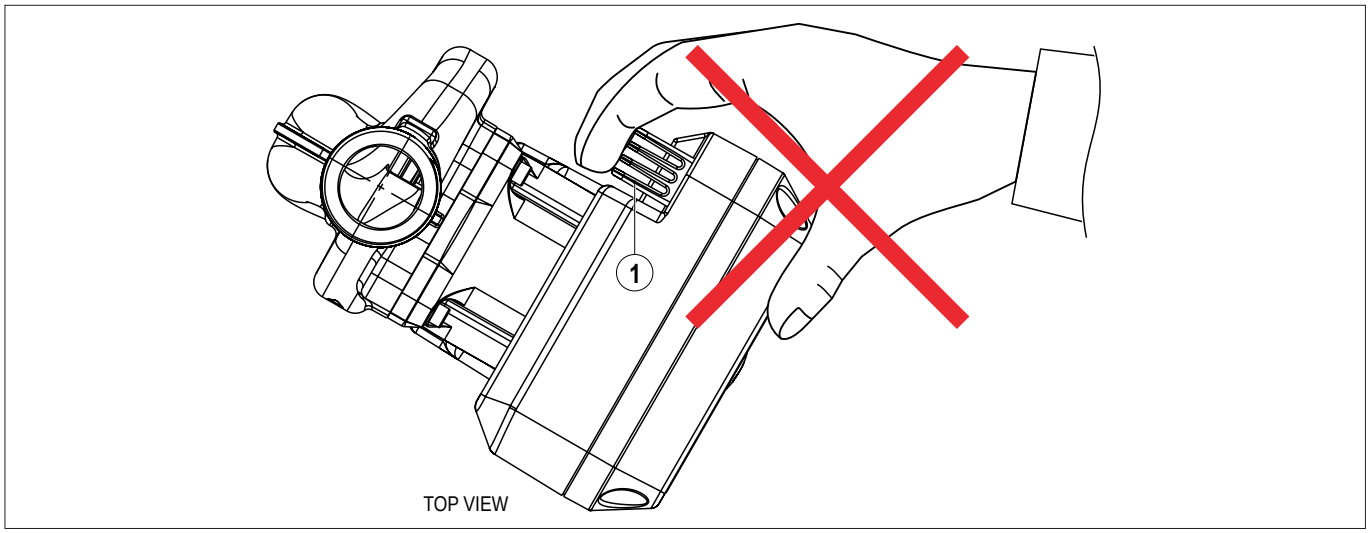


FIG. 6 *(It is forbidden to handle the circulator holding it on the heat sink)*

10 STORAGE

If the circulator shall remain unused for a long time, it is necessary to:
1) Check that the circulator is in "Safety state" (see par. 5.1).
2) Grease the mechanical parts.
3) Clean the circulator.
4) Protect the circulator with a cloth or another protective measure to prevent dust buildup.

⚠ CAUTION
IT IS FORBIDDEN TO STOCK THE CIRCULATOR LETTING IT EXPOSED TO WEATHERING AGENTS, DIRECT SUNLIGHT AND DUST.

11 INSTALLATION

⚠ WARNING

THE CIRCULATOR CAN ONLY BE INSTALLED BY THE MECHANICAL AND HYDRAULIC MAINTENANCE TECHNICIAN AND BY THE ELECTRICAL MAINTENANCE TECHNICIAN.

11.1 MOUNTING POSITIONS

⚠ WARNING

IT IS MANDATORY TO INSTALL THE CIRCULATOR WITH THE AXIS OF THE HORIZONTAL MOTOR SHAFT TO THE FLOOR.

THE MOUNTING POSITIONS OF THE CIRCULATOR REFER TO BOTH THE MAX AND MAX PRO MODELS.

⚠ WARNING

IT IS FORBIDDEN TO MOUNT THE CIRCULATOR WITH THE QUICK CONNECTOR OF THE POWER CABLE UPWARDS.

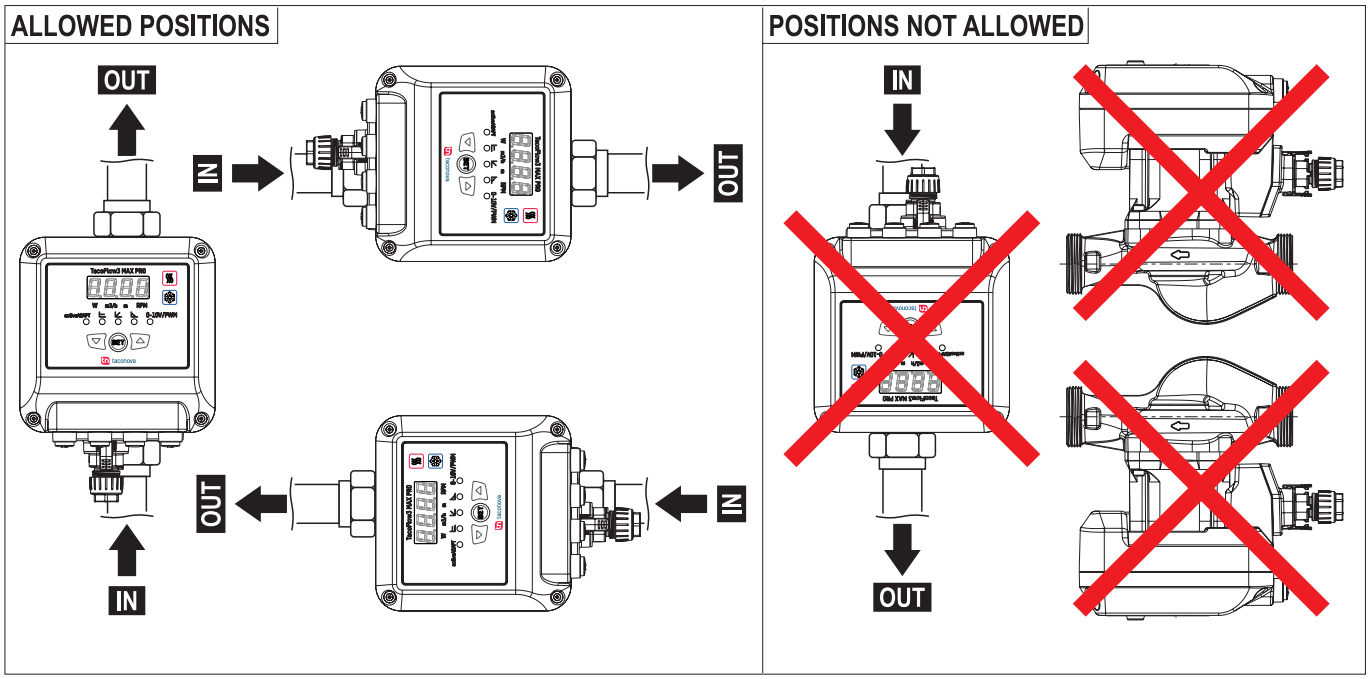


FIG. 7 *(Mounting positions)*

11.2 MOTOR BODY POSITIONS

INFORMATION

THE MOTOR BODY CAN BE ROTATED TO THE POSITIONS SHOWN IN FIG. 8.

THE POSITIONS OF THE MOTOR BODY REFER TO BOTH THE MAX AND MAX PRO MODELS.

⚠ DANGER

IT IS COMPULSORY TO VERIFY THAT THE CIRCULATOR IS IN “SAFETY STATE” BEFORE PERFORMING MAINTENANCE OR ADJUSTMENTS. THERE ARE RESIDUAL RISKS NO. 1, NO. 2 AND NO. 3 (SEE CHAP. 8).

Adjust the motor body as follows:

1) Unscrew and remove the four engine cover screws (FIG. 8 - Ref. 1).
2) Rotate the engine cover (FIG. 8 - Ref. 2) in the desired position without removing it from the circulator body.
3) Insert and tighten the four screws (the tightening torque must correspond to a value of 3.3 ± 0.5 Nm).

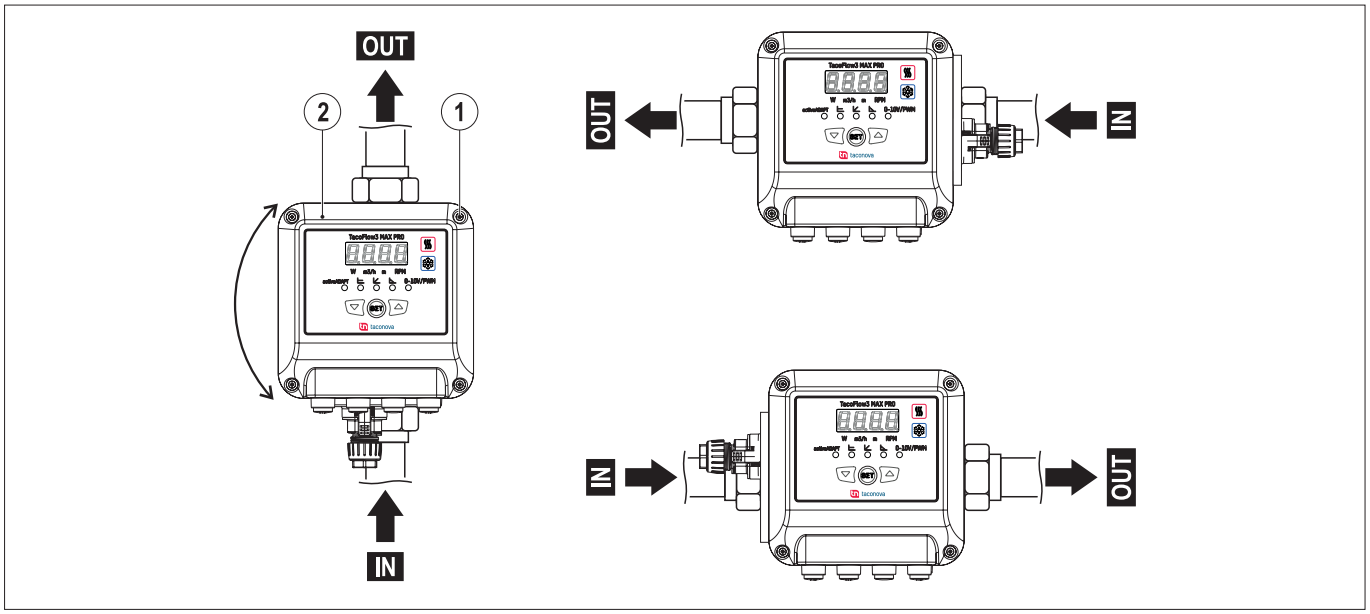


FIG. 8 *(Positions of the engine cover)*

11.3 ASSEMBLY OF PIPES

1) Check the water flow direction indicated by the arrow on the circulator (FIG. 9 - Ref. 1).
2) Close the shut-off valves (FIG. 9 - Ref. 2).
3) Place the circulator on the pipes without creating tension and with the motor shaft positioned horizontally (FIG. 9 - Ref. 3).
4) Insert the gaskets (FIG. 9 - Ref. 4).
5) Screw the unions with suitable equipment (FIG. 9 - Ref. 5) on the circulator.

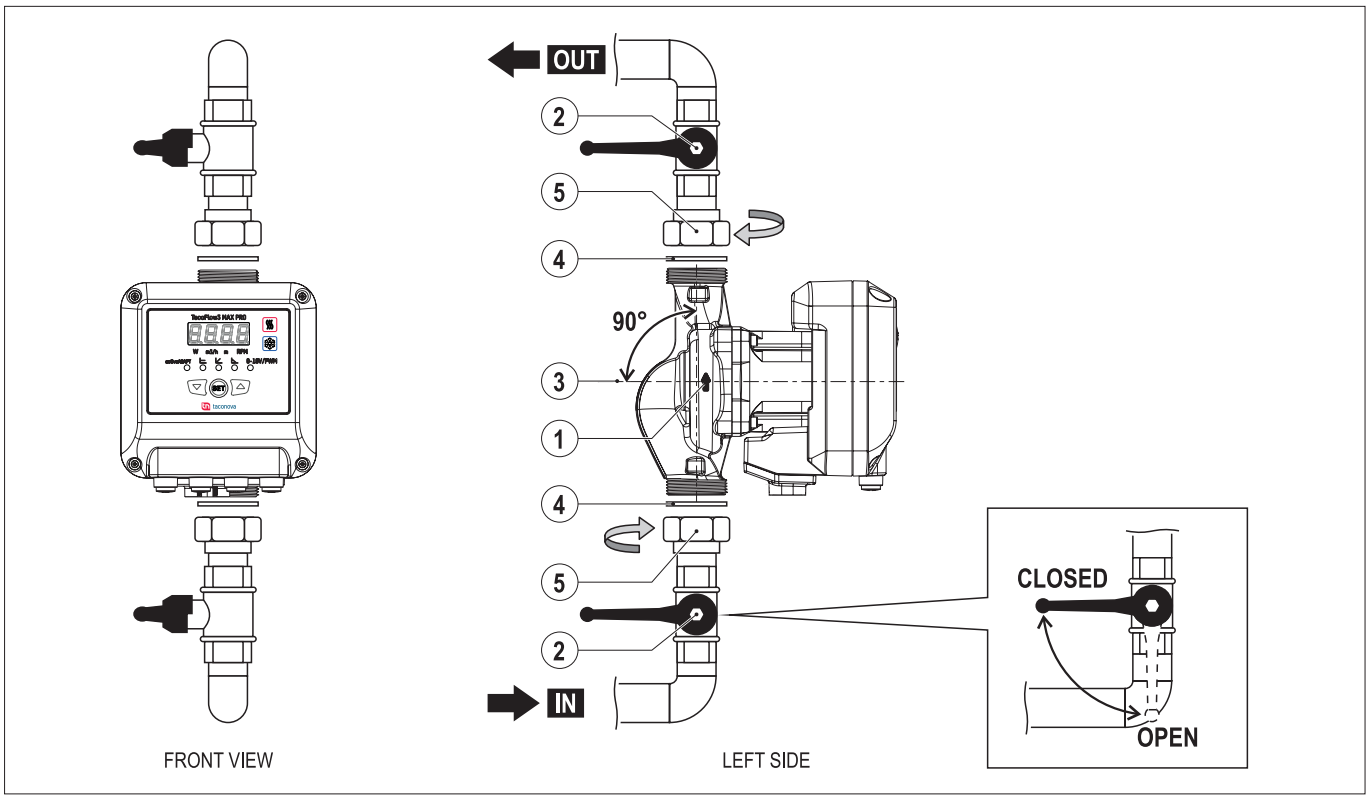


FIG. 9 *(Assembly)*

11.4 ISOLATION OF THE CIRCULATOR BODY

INFORMATION

TO LIMIT HEAT LOSS FROM THE CIRCULATOR BODY, IT IS POSSIBLE TO MOUNT THE THERMAL INSULATING SHELLS (FIG. 3 - REF. 12).

11.5 CONNECTION TO THE POWER SOURCE

To connect the circulator to the power source proceed as follows:

⚠ DANGER

THE ELECTRICAL POWER SUPPLY LINE TO WHICH THE CIRCULATOR IS CONNECTED MUST COMPLY WITH THE REQUIREMENTS OF THE LEGISLATION IN FORCE IN THE COUNTRY OF USE, BE EQUIPPED WITH A SUITABLE EARTHING SYSTEM AND A DIFFERENTIAL SWITCH, WHICH INTERRUPTS THE POWER SUPPLY IF THE CURRENT OF THE GROUND DISPERSION EXCEEDS 30 mA FOR 30 ms, OR AN INSULATOR SUITABLE FOR MAXIMUM POWER ABSORBED (SEE PAR. 5.5).

IT IS COMPULSORY TO CHECK THAT THE MAINS ELECTRICAL CHARACTERISTICS (VOLTAGE, PHASE, FREQUENCY, POWER) ARE COMPATIBLE WITH THE CIRCULATOR (SEE PAR. 5.5).

⚠ WARNING

THE CIRCULATOR MUST BE FITTED WITH A MAIN ELECTRICAL SWITCH (PROVIDED BY THE CUSTOMER) OR A PLUG CONNECTED TO THE POWER SUPPLY CABLE THAT GUARANTEES THE DISCONNECTION OF THE ELECTRICITY IN THE EVENT OF MAINTENANCE OR SHUTDOWN.

THE CIRCULATOR'S ELECTRIC CONNECTION TO THE MAINS DISTRIBUTION NETWORK IS CARRIED OUT EXCLUSIVELY BY THE AUTHORIZED OPERATOR IN FULL COMPLIANCE WITH THE PROJECT DATA.

IT IS MANDATORY TO USE A SUITABLE CABLE FOR THE ELECTRICAL CHARACTERISTICS REQUIRED (FIG. 10 - REF. 1).

THE CORRECT ROTATION IS INDICATED BY THE ARROW PLACED ON THE CIRCULATOR BODY.

⚠ WARNING

ANY TYPE OF ELECTRICAL EQUIPMENT USED FOR CONNECTION MUST BE SUITABLE FOR USE WITH "CE" MARKING (IF SUBJECT TO LOW VOLTAGE DIRECTIVE 2014/35/EU) AND COMPLYING WITH THE REQUIREMENTS REQUIRED BY APPLICABLE LAWS IN THE COUNTRY OF USE OF THE CIRCULATOR.

⚠ CAUTION

THE MANUFACTURER DECLINES ANY LIABILITY FOR MALFUNCTION OR ANOMALIES OF OPERATION OF THE CIRCULATOR CAUSED BY POWER DYSFUNCTIONS EXCEEDING THE TOLERANCES FORECAST BY THE DISTRIBUTOR (VOLTAGE ± 10% - FREQUENCY ± 2%).

1) Use a cable (FIG. 10 - Ref. 1) with the features shown in FIG. 10.
2) Connect the blue (neutral) wire to the terminal N (FIG. 10 - Ref. 2).
3) Connect the black or brown (phase) wire to the terminal L (FIG. 10 - Ref. 3).
4) Connect the yellow/green color (earth) to the terminal G (FIG. 10 - Ref. 4).
5) Connect the terminal block in the appropriate seat.
6) Manually screw the cable gland (MAX. Tightening torque 2 Nm).
7) Remove the protective label.
8) Insert the plug & play connector on the pump until both hooks click.
9) Enable the voltage and check the connection by the LED on (FIG. 10 - Ref. 5) on the MAX model and the ignition of the display (FIG. 10 - Ref. 6) on the MAX PRO model.

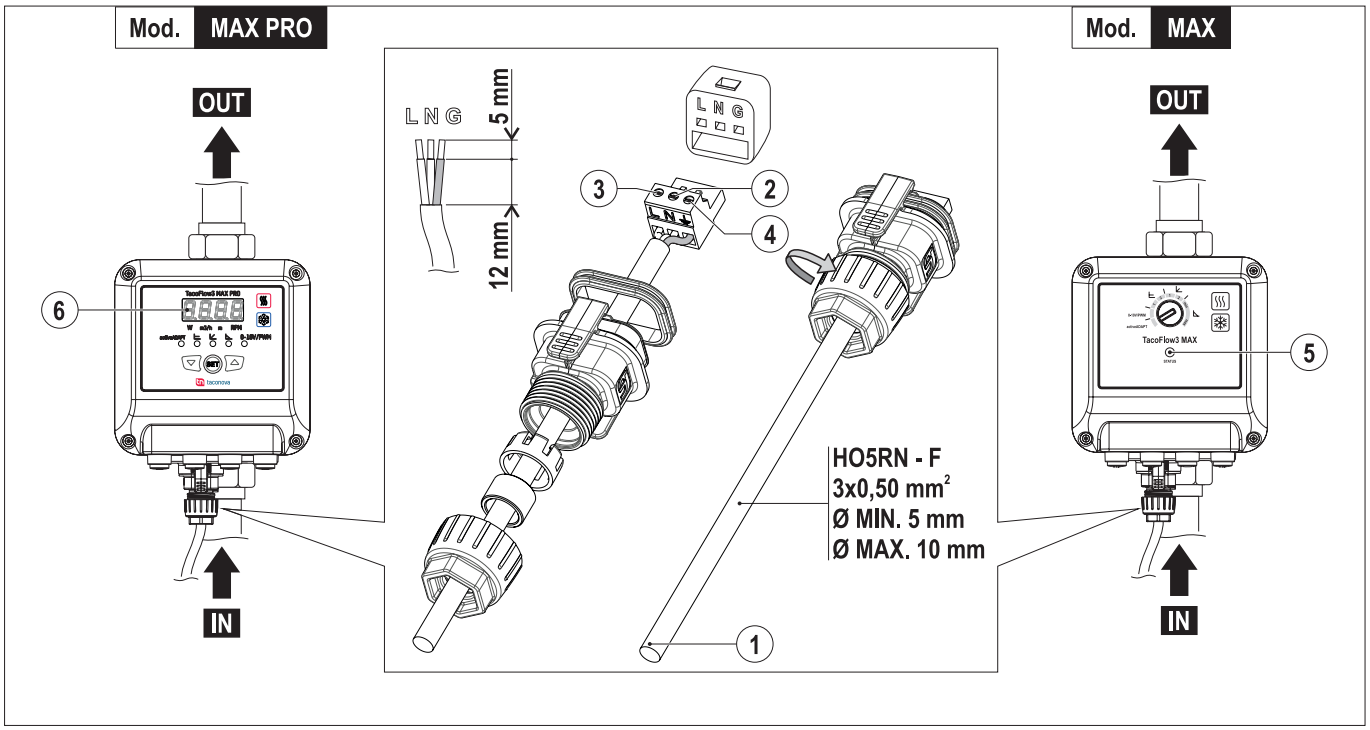


FIG. 10 *(Connection to the power source)*

12 USE OF THE CIRCULATOR

12.1 CHECKS AND OPERATIONS BEFORE STARTING

⚠ DANGER

BEFORE USING THE CIRCULATOR, IT IS COMPULSORY FOR THE AUTHORIZED OPERATORS TO READ AND BE SURE THAT THEY HAVE FULLY UNDERSTOOD ALL PARTS OF THIS MANUAL.

⚠ WARNING

IT IS COMPULSORY, BEFORE STARTING THE CIRCULATOR, TO PERFORM THE FOLLOWING CHECKS AND OPERATIONS.

Ref.	Checks and operations
1	Make sure that there are not any unauthorized people close to the circulator
2	Make sure that the circulator is fully complete in all its parts
3	Ensure the integrity and correct operation of the guard and protection devices chap. 6
4	Check that the shut-off valves are open
5	Check that the system is pressurized
6	Check the condition of the power supply cable
7	Use the compulsory personal protective equipment (PPE) (see chap. 8)
8	Make sure you understand the correct installation procedure

TAB. 18 *(Checks and operations before starting)*

12.2 STARTUP

⚠ DANGER

BEFORE STARTING THE CIRCULATOR, IT IS COMPULSORY TO READ AND BE SURE THAT YOU HAVE FULLY UNDERSTOOD ALL PARTS OF THIS MANUAL.

⚠ WARNING

BEFORE ANY STARTUP OF THE CIRCULATOR IT IS COMPULSORY TO PERFORM THE CHECKS OF PAR. 12.1.

1) Provide power supply to the circulator bringing the main switch (by the Customer) into Pos. “I” or by inserting the plug into a suitable electrical outlet.
2) Check the LED on the circulator.

12.2.1 VENT OF THE SYSTEM

At the start, the circulator can be noisy due to the presence of air in the system.
The presence of air in the system is signaled by the flashing white LED lighting up (In the MAX PRO mode, the operation status LED turns white) (see par. 5.12.1) the system must be vented.

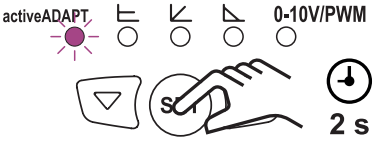
⚠ WARNING

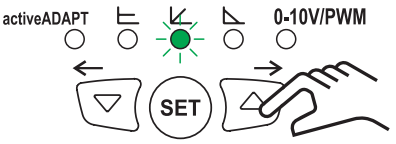
IT IS MANDATORY TO PERFORM VENTING OPERATIONS USING THE MANDATORY PPE. THERE IS THE RESIDUAL RISK NO. 1 AND NO. 2 (SEE CHAP. 7).

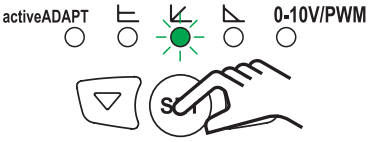
1) Open the air vent valve in the hydraulic system above the circulator.
2) Set the circulator to the MAX position.
3) Allow the circulator to run for a short time.
4) After venting the system the LED stops flashing and changes color, set the circulator to the desired function.

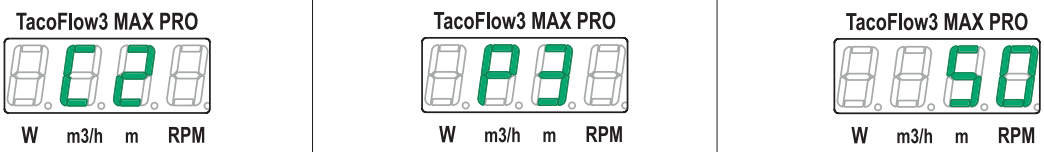
12.2.2 CIRCULATOR SETTING MAX PRO MOD.

Change the performance of the circulator (head) according to the need, using the "SET", DOWN and UP buttons.

<table>
<tr><th>LED</th><th>Function</th><th>Setting</th></tr>
<tr><td>activeADAPT
Purple color (**)</td><td>ActiveADAPT (*)</td><td rowspan="5"> 

1) Press the "SET" button for 2 s, the LED indicating the operating status starts flashing quickly.
 

2) Press the UP or DOWN buttons to select the new operating mode and the desired value for the constant, proportional and variable power curves (see display below).
 

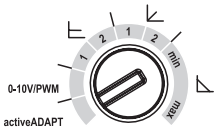
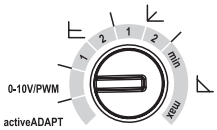
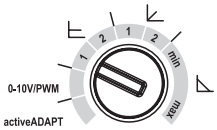
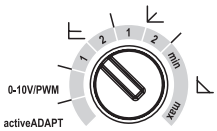
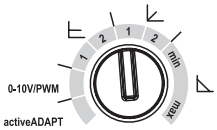
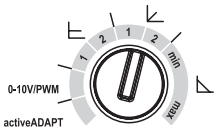
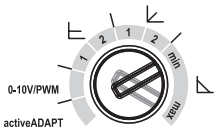
3) Press the "SET" button to confirm the desired operating mode and value.</td></tr>
<tr><td>C
Orange color (**)</td><td>Constant Curve
(C1 - C2 - C3 - C4 - C5)</td></tr>
<tr><td>P
Green color (**)</td><td>Proportional Curve
(P1 - P2 - P3 - P4 - P5)</td></tr>
<tr><td>min-max
Blue color (**)</td><td>Variable power curve
MIN - MAX (0÷100%)</td></tr>
<tr><td>0-10V/PWM
Yellow color (**)</td><td>External input
0-10 V or PWM</td></tr>
<tr><td colspan="3"> 

Constant Curve (C1 - C2 - C3 - C4 - C5) | Proportional Curve (P1 - P2 - P3 - P4 - P5) | Variable power curve MIN - MAX (0÷100%)</td></tr>
<tr><td colspan="3">(*) Factory settings
(**) Turns white to indicate the presence of air in the system or red to indicate the presence of an error</td></tr>
</table>

TAB. 19 *(Set-up of the circulator MAX PRO mod.)*

12.2.3 CIRCULATOR SETTING MOD. MAX

Change the performance of the circulator (head) according to the need by turning the selector using suitable equipment. The selection of the correct operating curve depends on the characteristics of the system and the request for heat from the system.

LED	Position	Function
activeADAPT Purple color		ActiveADAPT (*)
0-10V/PWM Yellow color		External input 010 V or PWM
C Orange color		Lower Constant Curve CI
		Intermediate Constant Curve CII
P Green color (**)		Lower Proportional Curve P1
		Intermediate Proportional Curve P2
min-max Blue color		Variable power curve MIN. - MAX. (100%)
(*) *Factory settings* (**) *Turns white to indicate the presence of air in the system or red to indicate the presence of an error*		

TAB. 20 *(Set-up of the circulator mod. MAX)*

12.2.4 EXTERNAL CONNECTION FOR 0-10 V / PWM SIGNAL

⚠ WARNING

IF THERE IS A NEED TO MAKE THE EXTERNAL CONNECTION (PLC / PUMP CONTROLLER) IT IS MANDATORY TO PERFORM THE FOLLOWING OPERATIONS.

INFORMATION

CONNECTION INSTRUCTIONS VALID FOR BOTH THE MAX AND MAX PRO MODELS.

1) Unscrew the four screws (FIG. 11 - Ref. 1) fixing the motor cover (FIG. 11 - Ref. 2).
2) Unscrew a signal output cap (FIG. 11 - Ref. 3).
3) Disconnect the connector (FIG. 11 - Ref. 4) from the electronic board (FIG. 11 - Ref. 5).
4) Insert the cable (FIG. 11 - Ref. 6) in the cable gland M12x1.5 (FIG. 11 - Ref. 7) (not supplied) and screw it to the cover.
5) Strip (MIN. 5 mm) the ends of the wires, insert them into the connector (FIG. 11 - Ref. 4) and fix them with screws (FIG. 11 - Ref. 8).
6) Connect the connector to the electronic board, close the motor cover and secure it with the screws.

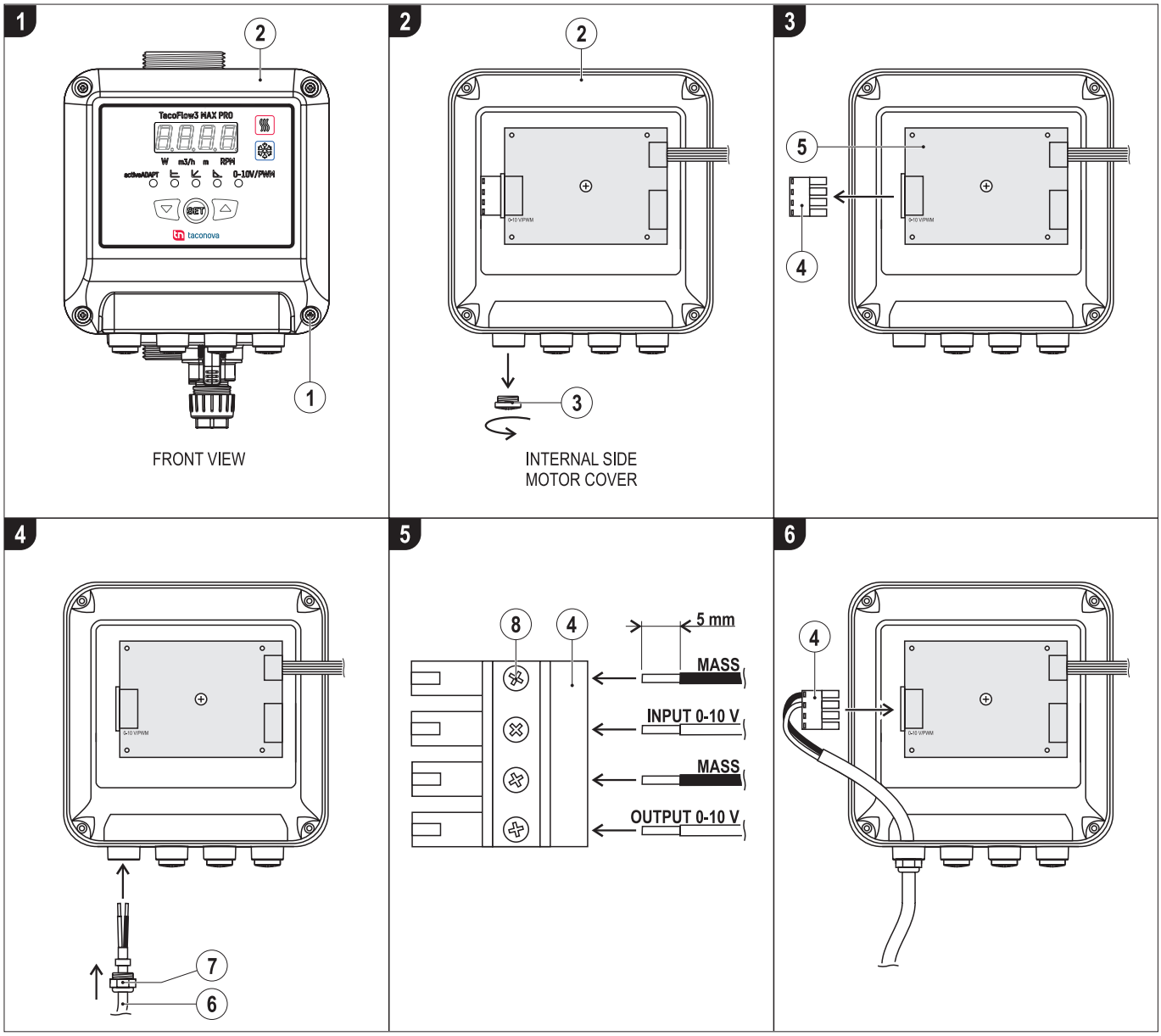


FIG. 11 *(External connection for 0-10 V / PWM signal)*

12.2.5 STANDBY MODE (MAX PRO MOD.)

In the operating mode with external connection for 0-10 V / PWM signal, the "Standby" mode is indicated by the yellow LED (flashing slowly) and the word "Stb" on the display (see FIG. 12).

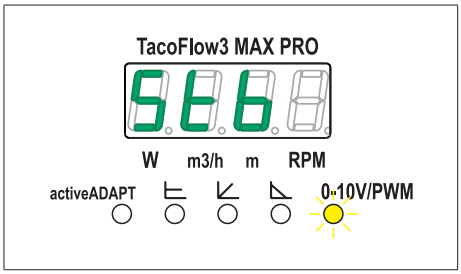


FIG. 12 *(Standby mode)*

12.2.6 ANALOGUE INPUT

In the "external input" mode, the circulator accepts either a DC voltage signal or a PWM signal. The selection of the signal type is automatically made by the circulator without operator intervention.

12.2.7 INPUT 0-10V

The circulator operates at variable speed depending on the DC input voltage.
At voltages below 1.5 V, the circulator is in "standby" mode.
At voltages between 2 V and 10 V, the circulator operates at a variable speed depending on the voltage:

- 0% for a voltage not exceeding or equal to 2 V
- 50% at 6 V
- 100% for voltages greater than or equal to 10 V

Between 1.5 V and 2 V the circulator can be in "standby" or at minimum speed depending on the previous state (hysteresis).

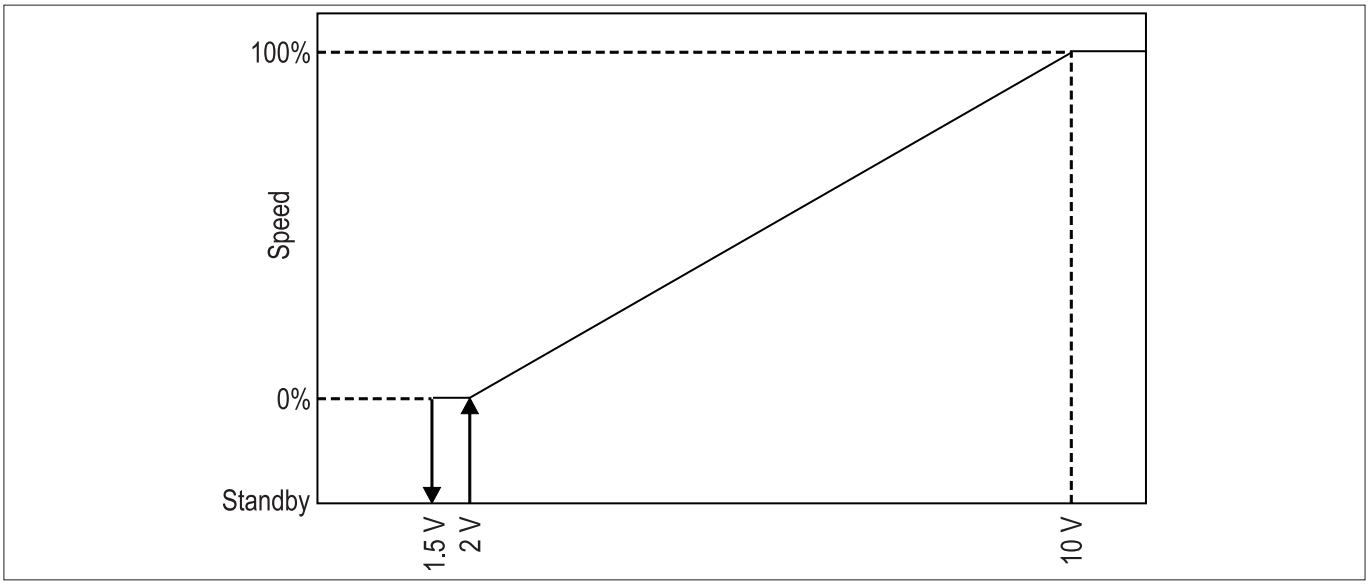


FIG. 13 *(Analogue input)*

INFORMATION
IF THE INPUT REMAINS DISCONNECTED, THE CIRCULATOR GOES INTO STANDBY MODE.

12.2.8 PWM INPUT

The circulator operates at variable speed according to the incoming duty cycle.
The input signal shall be a square wave with a frequency between 200 Hz and 5 kHz and an amplitude between 5 V and 12 V.

With a duty cycle between 0 and 98%, the circulator operates at variable speed:

- 0% with a duty cycle of less than 5%
- 50% with a 50% duty cycle
- 100% with a duty cycle of less than 95%

INFORMATION
WITH A DUTY CYCLE OF 100%, THE CIRCULATOR IS NOT ABLE TO RECOGNIZE THE SIGNAL AS A PWM INPUT AND THEREFORE THE WORKING SPEED DEPENDS ON THE INPUT VOLTAGE, AS IN THE CASE OF THE 0-10 V INPUT.

12.2.9 ANALOG OUTPUT

The circulator has an analog output to indicate the operating status and the presence of any errors.

Voltage	State
0 V	Circulator off, not powered
2 V	Circulator powered in standby
4 V	Circulator on and running
6 V	Warning presence (overheating, air)
10 V	Alarm presence (Circulator blocked, undervoltage, overtemperature)

TAB. 21 *(Analog output)*

12.2.10 ERRORS LIST (MAX PRO MOD.)

The presence of errors is indicated by the red LED (in MAX PRO mode the LED of the operating status turns red) and by the "error code" on the display (see TAB. 22).

Code	Meaning	Circulator status
E1	Pump locked / loss of step	Stop
E2	Undervoltage	Stop
E3	Overheating warning	It operates in limited power
E4	Overheating alarm	Stop
E5	Communication with inverter card is interrupted	It works in recovery mode
E6	SW cards error. Pumps are incompatible with each other	It works in recovery mode

TAB. 22 *(Code and meaning of the error)*

12.2.11 TECHNICAL MENU (MAX PRO MOD.)

Proceed as follows to access the technical menu:

1) Press the UP and DOWN buttons simultaneously for 5 s, the message “tECH” will appear in the display.
2) Press the “SET” button and select the parameter to be displayed by pressing the UP or DOWN buttons (see TAB. 23).
3) Press the “SET” button to select the desired parameter.

INFORMATION
AFTER 10 S OF INACTIVITY, THE CIRCULATOR LEAVES THE TECHNICAL MENU AND RETURNS TO NORMAL OPERATION.

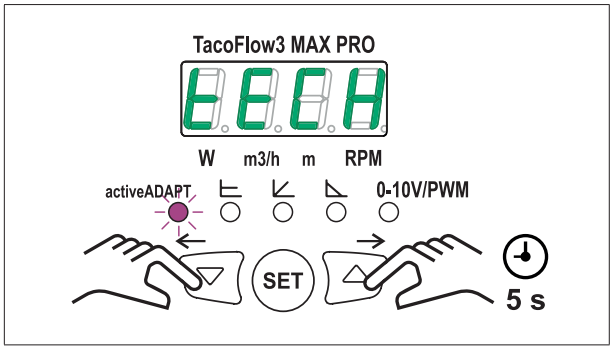


FIG. 14 *(Technical menu)*

Parameters	Meaning
T 0	Display Firmware version
T 1	Inverter Firmware version
T 2	Unit of measurement shown on the display: • SI = Système international (European) • IU = Imperial units (Anglo-Saxon)
T 3	Maximum pump head / model (60-80 or 100)
T 4	Analog input voltage 0-10 V
T 5	"Duty cycle" PWM input
T 6	Mains voltage
T 7	Internal inverter voltage
T 8	Pump working hours (in thousands, 0.010 = 10 hours, 101.0 = 101000 hours)
T 9	Ignitions counter
T 10	Standby counter
T 11	Rotor blocks counter
T 12	Step losses counter
T 13	Undervoltages counter
T 14	Overvoltages counter
T 15	Counter for missing internal cards communications

TAB. 23 *(Technical menu parameters)*

12.3 STOP

1) Remove the power supply to the circulator by moving the main switch (by the Customer) to Pos. “0”.
2) Check the LED OFF on the circulator.

12.4 EMERGENCY STOP

In order to react to situations of danger that may occur suddenly, authorized operators must:

1) Remove the power supply to the circulator by moving the main switch (by the Customer) to Pos. “0”.
2) Check the LED OFF on the circulator.

⚠ DANGER

AFTER STOPPING THE CIRCULATOR AND SIGNALING THE EMERGENCY TO THE SUPERVISOR IT IS MANDATORY TO REFRAIN FROM ANY INTERVENTION ON THE CIRCULATOR UP TO THE CONSENT OF THE SUPERVISOR.

⚠ DANGER

IT IS COMPULSORY TO VERIFY THAT THE CIRCULATOR IS IN “SAFETY STATE” BEFORE PERFORMING MAINTENANCE OR ADJUSTMENTS. THERE ARE RESIDUAL RISKS NO. 1, NO. 2 AND NO. 3 (SEE CHAP. 8).

12.4.1 RESET AFTER AN EMERGENCY STOP

After you remove the causes of the emergency and verify the absence of damage and/or anomalies to the line, acquire the consent of the Supervisor to proceed as follows:
1) Checks before starting (see par. 12.1).
2) Perform the start-up (see par. 12.2).

13 TROUBLESHOOTING

⚠ DANGER

IT IS FORBIDDEN TO USE THE CIRCULATOR IN THE PRESENCE OF ANY TYPE OF ANOMALY.

DURING MAINTENANCE WORK, IT IS FORBIDDEN TO LEAVE THE CIRCULATOR UNATTENDED AND WITHOUT ANY MEANS OF PREVENTING ACCESS TO UNAUTHORIZED PERSONS.

⚠ DANGER

IF THE MAINTENANCE PERSONNEL CANNOT RESOLVE THE ANOMALY, IT IS NECESSARY TO REQUEST THE INTERVENTION OF THE MANUFACTURER.

⚠ DANGER

ALL MAINTENANCE OPERATIONS ON THE CIRCULATOR MUST BE CARRIED OUT WITH THE CIRCULATOR IN “SAFETY STATE” (SEE PAR. 5.1).

Anomaly	LED indication	Causes	Troubleshooting
1) The circulator is noisy	Switched on	Suction pressure is insufficient - Cavitation	Increase the inlet pressure of the system within the permitted range TAB. 20 - par. 12.2.2
	Switched on	Presence of foreign bodies in the impeller	Check if any foreign bodies are present inside the pumping body
2) Strong liquid circulation noises	Lit white flashing	Presence of air in the system	Vent the system
	Switched on	The flow rate is too high	Reduce the rotation speed
3) The circulator does not start	Turned off	Lack of power supply	Check the voltage of the electrical system. Check the circulator connection
		A system fuse is defective	Check the fuses and replace them if necessary
		The circulator is defective	Replace the circulator
	Lit red flashing	Overheating	Wait for the circulator to cool down and check for restart. Check that the temperature of the liquid and the room temperature are included in the ranges indicated in TAB. 9 - par. 5.9

TAB. 24 *(Troubleshooting)*

14 MAINTENANCE

14.1 GENERAL WARNINGS

⚠ DANGER

ALL MAINTENANCE OPERATIONS ON THE CIRCULATOR MUST BE CARRIED OUT WITH THE CIRCULATOR IN “SAFETY STATE” (SEE PAR. 5.1).

⚠ DANGER

IT IS FORBIDDEN TO THE AUTHORIZED OPERATORS TO LET THE CIRCULATOR UNGUARDED DURING THE MANUFACTURING OPERATIONS WITHOUT PREPARING ALL NECESSARY ACTIONS TO AVOID ACCESS OF UNAUTHORIZED PERSONS.

⚠ WARNING

AUTHORIZED OPERATORS SHOULD CARRY OUT ONLY THE MAINTENANCE WORKS REQUIRED ACCORDING TO THEIR SPECIFIC PROFESSIONAL COMPETENCE AFTER APPROVAL BY THE SAFETY RESPONSIBLE PERSON.

⚠ WARNING

IT IS FORBIDDEN THE USE OF PRODUCTS OTHER THAN THOSE SET FORTH BY THE MANUFACTURER (SEE PAR. 5.8).

IT IS COMPULSORY FOR THE AUTHORIZED OPERATORS TO READ AND BE SURE TO FULLY UNDERSTAND IN ALL PARTS THE RELATED SAFETY CARDS PROVIDED BY THE MANUFACTURERS.

14.2 ROUTINE MAINTENANCE

Routine maintenance is the set of interventions to maintain optimal conditions of use and operation of the circulator (adjustments, visual check, etc.) carried out by the authorized operator.
The circulator does not require any special maintenance.

14.3 PERIODIC INSPECTION OF THE EFFECTIVENESS OF GUARDS AND PROTECTION DEVICES

⚠ DANGER

IT IS FORBIDDEN TO NEUTRALIZE, TAMPER WITH, MANIPULATE OR EVADE THE GUARDS AND PROTECTION DEVICES INSTALLED IN THE CIRCULATOR.

IT IS FORBIDDEN TO REPLACE PROTECTIVE COVERS OR PROTECTIVE DEVICES OF THE CIRCULATOR WITH NON-ORIGINAL SPARE PARTS.

⚠ WARNING

IT IS COMPULSORY TO CHECK AT ANY TIME THE PROPER FUNCTIONING OF ALL THE GUARDS OR PROTECTION DEVICES.

IT IS COMPULSORY TO PROMPTLY REPLACE ANY GUARDS AND PROTECTION DEVICES THAT ARE MALFUNCTIONING OR DAMAGED.

⚠ DANGER

ALL OPERATIONS TO VERIFY THE INTEGRITY AND EFFECTIVENESS OF THE GUARDS AND PROTECTIVE DEVICES MUST BE CARRIED OUT BEFORE ANY START-UP AND WITH THE CIRCULATOR IN “SAFETY STATE” (SEE PAR. 5.1).

⚠ DANGER

DURING CHECK OPERATIONS, IT IS FORBIDDEN TO LEAVE THE CIRCULATOR UNATTENDED AND WITHOUT ANY MEANS OF PREVENTING ACCESS TO UNAUTHORIZED PERSONS.

⚠ WARNING

ANY REPLACEMENT OF GUARDS AND PROTECTIVE DEVICES SHOULD ONLY BE CARRIED OUT BY A MAINTENANCE TECHNICIAN  OR BY A MANUFACTURER'S TECHNICIAN 

INFORMATION

THE SPARE PARTS SPECIFICATIONS AND ORDERING METHODS ARE LISTED ON CHAP. 16.

14.4 EXTRAORDINARY MAINTENANCE

It is the set of activities carried out to maintain conditions of use and operation of the line through various types of intervention (adjustments, replacements, etc.) that are to be carried out exclusively by a qualified technician.

⚠ WARNING

EXTRAORDINARY MAINTENANCE INTERVENTIONS MAY BE CARRIED OUT ONLY BY A QUALIFIED TECHNICIAN PROVIDED BY THE MANUFACTURER AND/OR BY THE SUPPORT CENTER.

15 INSTRUCTIONS FOR OUT OF SERVICING, DISMANTLING AND DISPOSAL

⚠ WARNING

IT IS FORBIDDEN TO DISCHARGE LIQUIDS AND RESIDUAL OILS IN THE ENVIRONMENT.

⚠ WARNING

THESE PRODUCTS DEEMED AS POLLUTING AND DANGEROUS SHALL BE EXCLUSIVELY DISPOSED OF ENTRUSTING AUTHORIZED COMPANIES SPECIALIZED FOR THE DIFFERENT TYPES OF PRODUCT.

DIFFERENTIATE THE PARTS THAT CONSTITUTE THE CIRCULATOR ACCORDING TO THE DIFFERENT TYPES OF CONSTRUCTION MATERIALS (PLASTIC, IRON, ETC.).

UPON DEMOLITION OF THE CIRCULATOR, IT IS MANDATORY TO COMPLY WITH THE PROVISIONS OF THE REGULATIONS IN FORCE.

⚠ CAUTION

IT IS COMPULSORY FOR ALL COMPONENTS OF THE CIRCULATOR TO BE IDENTIFIED PURSUANT TO THE DEFINITIONS OF THE "EWC CODES" (EUROPEAN WASTE CATALOGUE) AND DISPOSED OF BY ENTRUSTING SPECIALIZED AND AUTHORIZED COMPANIES, IN TOTAL COMPLIANCE WITH THE REGULATIONS IN FORCE IN THE COUNTRY OF DEMOLITION.

⚠ CAUTION

THE WASTE ELECTRIC AND ELECTRONIC EQUIPMENT (WEEE) HAVE TO BE DISPOSED OF IN ABSOLUTE COMPLIANCE WITH THE REGULATIONS IN FORCE IN THE COUNTRY OF DEMOLITION OF THE CIRCULATOR.

16 SPARE PARTS

16.1 HOW TO ORDER

⚠ CAUTION

ORIGINAL SPARE PARTS FOR ANY REPLACEMENT HAVE TO BE REQUESTED ONLY TO THE MANUFACTURER OR TO THE SUPPORT CENTER.

17 ANNEXES

17.1 DECLARATION OF DELIVERY OF THE INSTRUCTION MANUAL

THE EMPLOYER, PURSUANT TO THE LAWS IN FORCE ON OCCUPATIONAL SAFETY AND HEALTH OF EMPLOYEES AT THE PLACE OF WORK, DECLARES TO HAVE DELIVERED THIS MANUAL TO THE AUTHORIZED OPERATORS TO ASSURE A CORRECT INFORMATION AND TRAINING ON THE USE AND MAINTENANCE OF THE LINE.

Authorized operators	Date	Sign for delivery
Mr.	....../....../......	....
Mr.	....../....../......	....
Mr.	....../....../......	....
Mr.	....../....../......	....
Mr.	....../....../......	....
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Mr.	....../....../......	....
Mr.	....../....../......	....
Mr.	....../....../......	....

TAB. 25 *(Declaration of delivery of the instruction manual)*

(N.B. Before filling in this table, photocopy it for future reference.)

17.2 WIRING DIAGRAM

taconova
comfort solutions

Taconova reserves the right to make changes without prior notice.

Taconova Group AG
Neunbrunnenstrasse 40 | CH-8050 Zürich
T +41 44 735 55 55 | F +41 44 735 55 02
info@taconova.com

Taconova GmbH
Rudolf-Diesel-Straße 8 | DE-78224 Singen
T +49 7731 98 28 80 | F +49 7731 98 28 88
deutschland@taconova.com

Taconova Group AG
Kostelecká 879/59 | CZ-196 00 Praha 9-Čakovice
T +420 283 930 810 | F +420 266 310 386
cesko-slovensko@taconova.com

Taconova Polska Sp z.o.o
ul. Wrocławska 21/8 | PL-61-837 Poznań
Tel: +48 61 227 84 21
polska@taconova.com

TACO ITALIA S.r.L.
Via Galileo Galilei, 89/91 | IT-36066 Sandrigo (VI)
T +39 0444 666800 | F +39 0444 666801
info@tacoitalia.com | tacoitalia.com

taconova.com

Taco Family of Companies