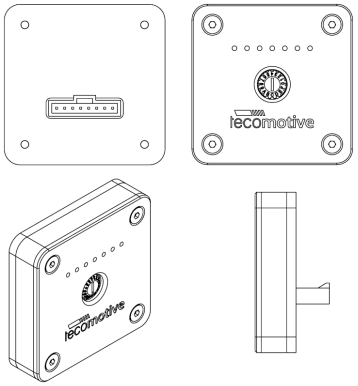
Tecomotive - tinyCWA – User Manual

(manual Version)

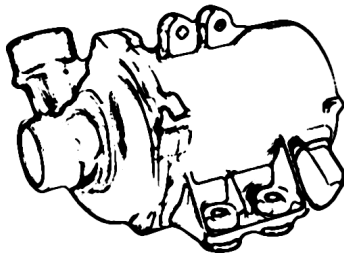
Overview



Contents

- tinyCWA controller
- Fuse holder
- Fuse(s)
- Connector 8 pin (controller)
- Connector 3-4 pin (water pump)
- Set of screws (controller mounting)

Introduction



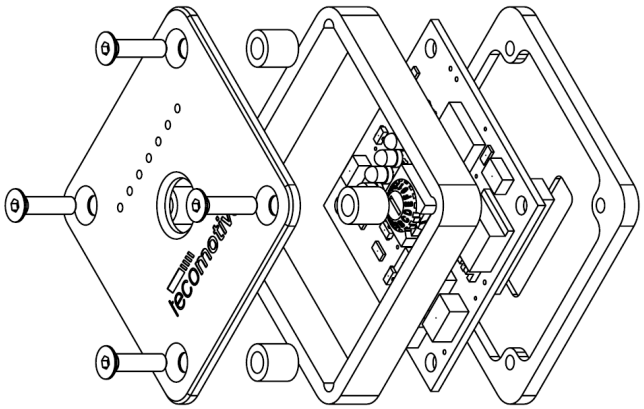
The Pierburg CWA200 was the first electronic water pump for line production introduced by BMW in 2004. They are now widely available in used cars and the aftermarket and got many advantages over conventional mechanical pumps. Some of which are the freedom of installation and the independence of engine revolutions. Also the pumps are very well built and with its brushless canned motor they are practical maintenance free. The “tinyCWA” controller can control the pump in the appropriate manner.

Operation

When activated the controller sends the chosen speed signal to the pump where the internal pump electronics then set it to the right speed.

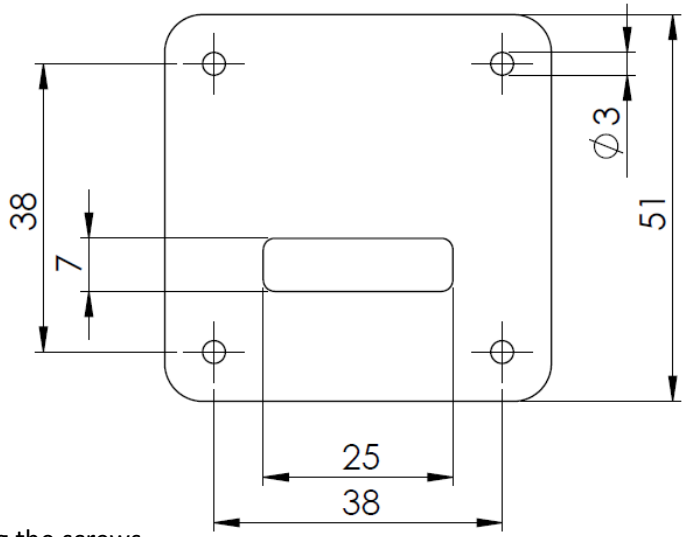
Features

- Simple to set up with only one rotary switch
- Choose your favorite pump speed in sixteen steps
- A seven LED display shows the current pump speed
- Compact and robust anodized aluminum case
- Additional 10Hz PWM (500mA “nearly” open collector) output

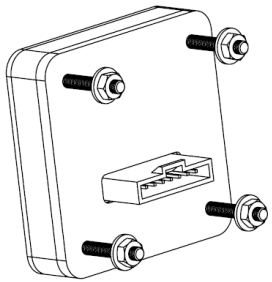


Installation

Installation drawing scale 1:1



Changing the screws



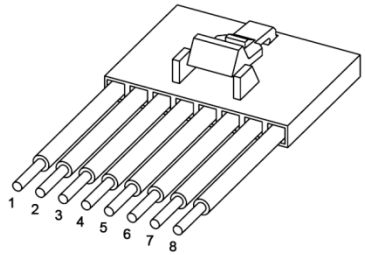
To mount the controller on a front panel you can change the four case screws (M3) to the longer ones which come with the kit.
Please only change one at the time. There are little
spacers inside the case which can get out of place without the screw.
(See the picture at the first page)
Of course the controller can be mounted anyway you like. (E.g. with double sided tape or zip ties …)

Connection

We made the connection as easy and intuitive as possible. So in general that means that the same color cables are meant to connect to each other.
A detailed connection diagram can be found on the last page.
Even though the CWA200 is electronically regulated to a max. load of 15 amps you should always use the fuse / fuse holder that comes with the kit.

Connector: Controller (8 pin)

Info: If you do not want any standby functionality you can connect the red wire (pin 2) to the ignition switch, too.

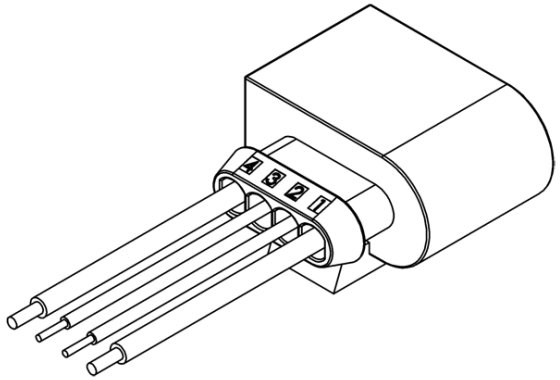


Attention: The 10Hz PWM output can only handle a maximum of 0.5 amps!

PIN	Color	Connection
1	Black	Ground GND -
2	Red	Battery +
3	Yellow	Ignition key +
4	Black	Not needed – please isolate
5	Orange	Not needed – please isolate
6	Blue	10Hz PWM (500mA “nearly” open collector) output
7	Grey / Red	Signal wire water pump
8	Grey / Black	Signal ground wire water pump

Pin2 Red	Pin3 Yellow	Controller Function
High	High	- working -
High	Low	- standby -
Low	High	- off -
Low	Low	- off -

Connector: Water pump (4 pin)

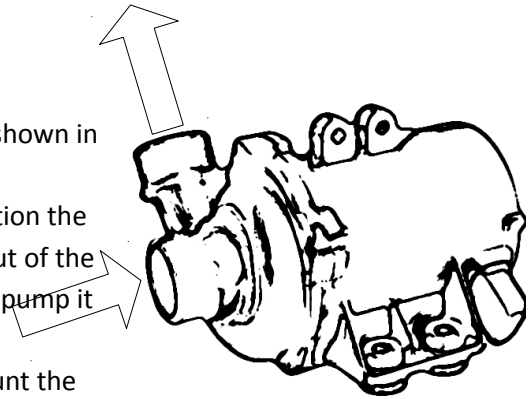


Attention: The main current flows through pin 1 and pin 4.

(CWA200 15 amps / CWA400 30 amps)
Please only use wires which are able to handle the current!

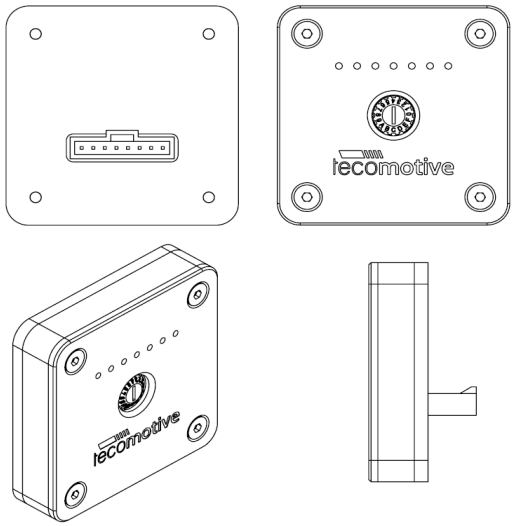
PIN	Color	Connection
1	Red	Battery +12V
2	Grey / Red	Signal wire from controller
3	Grey / Black	Ground wire from controller
4	Black	Ground GND

Water pump installation



In and outlet of the pump are shown in the picture.
To get a decent coolant circulation the pump should suck the water out of the bottom radiator port and then pump it back into the engine.
Also it is recommended to mount the pump as low as possible.

Attention: Please only mount the pump with appropriate rubber dampers because high vibration can damage the internal electronics!



Basic settings

The only thing you need to decide is what speed you want the pump to run. (See the list beside)
Turn the rotary switch to the associated character. Done.

Using the rotary switch

Right in the center of the controller's front panel you'll find the rotary switch. By turning it to a specific character you are able to set up all the things the controller can do.

The character that points to the bottom is the currently selected one. (You will see a little white dot by looking closely.)

Also it helps to use a little screwdriver for turning.

Rotary switch position's

You can turn the switch to 16 different positions. Every one of them stands for a different pump speed.

Just choose the one that's best for your application from the following list.

Program list

Position	Speed	Rev/min approx. CW A200	L/min approx. *	10Hz PWM Duty
0	Stop	0	0	0%
1	Min. Rev.	18	0,45	7%
2	7%	400	10	13%
3	14%	700	18	20%
4	21%	1000	26	27%
5	28%	1325	34	33%
6	35%	1640	42	40%
7	42%	1950	50	47%
8	51%	2320	60	53%
9	58%	2630	68	60%
A	65%	2950	76	67%
B	72%	3250	84	73%
C	79%	3570	92	80%
D	86%	3880	100	87%
E	93%	4190	108	93%
F	100%	4500	116	100%

Position	Speed	Rev/min approx. CW A50	L/min approx.	10Hz PWM Duty
0	Stop	?	0	0%
1	Min. Rev.	?	0,1	7%
2	7%	?	1,5 – 2	13%
3	14%	?	3,5 – 4	20%
4	21%	?	5 – 6	27%
5	28%	?	7 – 8	33%
6	35%	?	9 – 10	40%
7	42%	?	10 – 12	47%
8	51%	?	13 – 15	53%
9	58%	?	15 – 17	60%
A	65%	?	16 – 19	67%
B	72%	?	18 – 22	73%
C	79%	?	20 – 24	80%
D	86%	?	22 – 26	87%
E	93%	?	23 – 28	93%
F	100%	?	25 – 30	100%

Specifications Controller

Name:	Tecomotive „tinyCWA“
Dimensions:	51x51x13mm (without connector) 51x51x24mm (with connector)
Operating voltage:	8 to 16 Volts
Current consumption:	max. 40mA about 10mA in Standby mode
Temperature range:	-40°C to +100°C (-40°F to +212°F)
Weight:	about 40 grams (1.4 ounces)

Specifications Water pump

Name:	Pierburg „CWA200“
Dimensions:	100x125x175mm
Operating voltage:	8 to 16 Volts
Current consumption:	max. 15A 0,2mA in Standby mode
Speed:	18 to 4500rpm
Pump pressure:	0.45 bar
Volume flow:	116 l/min
Temperature range:	-40°C to +140°C -40°F to +284°F

Example part numbers:

Pierburg:
7.00294.17.0

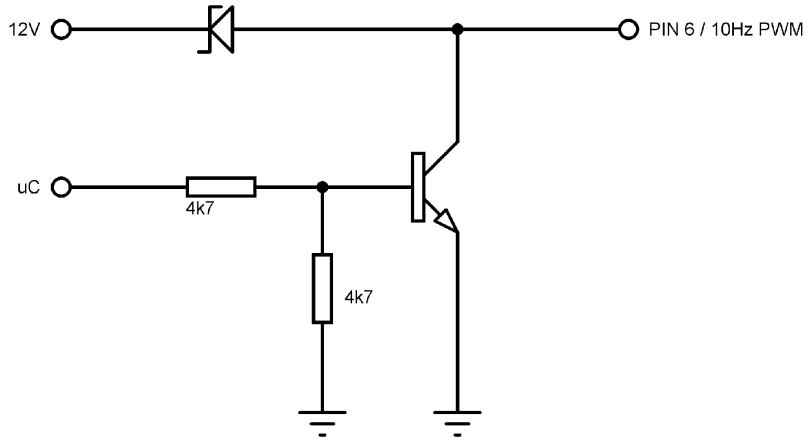
BMW:
11 51 7 586 925

BMW old:
11 51 7 563 183
11 51 7 546 994
11 51 7 521 584
11 51 7 545 201

PIN 6 - 10Hz “nearly” open collector output circuit

This is the internal circuit of the controllers 10Hz open collector output. (for information)

Please use this PIN only if you know what you are doing!



Safety notes

Disclaimer

The installation should only be done by experienced or special trained personnel with the necessary knowledge.
We cannot be held liable for any damages on your car, engine or the product itself!

General notes

Before you plug in the devices make sure all the cables are wired correctly!

The installation needs special automotive and electrical knowledge.
Improper connection and use can damage your car, the engine or the product itself.

Installation

Before you start with the installation disconnect the cars battery to prevent any unintentional short circuits.

Pay attention to any potential safety notes from your car manufacturer.
(E.g. regarding airbags, alarm systems, ECU's or immobilizers)

Avoid smoking, fire, flying sparks or static electricity charges.

Be careful not to damage any parts (e.g. battery, wires, hoses…) while drilling holes.

Don't lay cables or connectors in areas which are exposed to spray water.

Don't mount the wires / sensor in areas which are exposed to moving or rotating parts.

Operation

Any modifications on your car could be against the law.
It is your responsibility to get all the necessary information and permissions to drive the car legally.

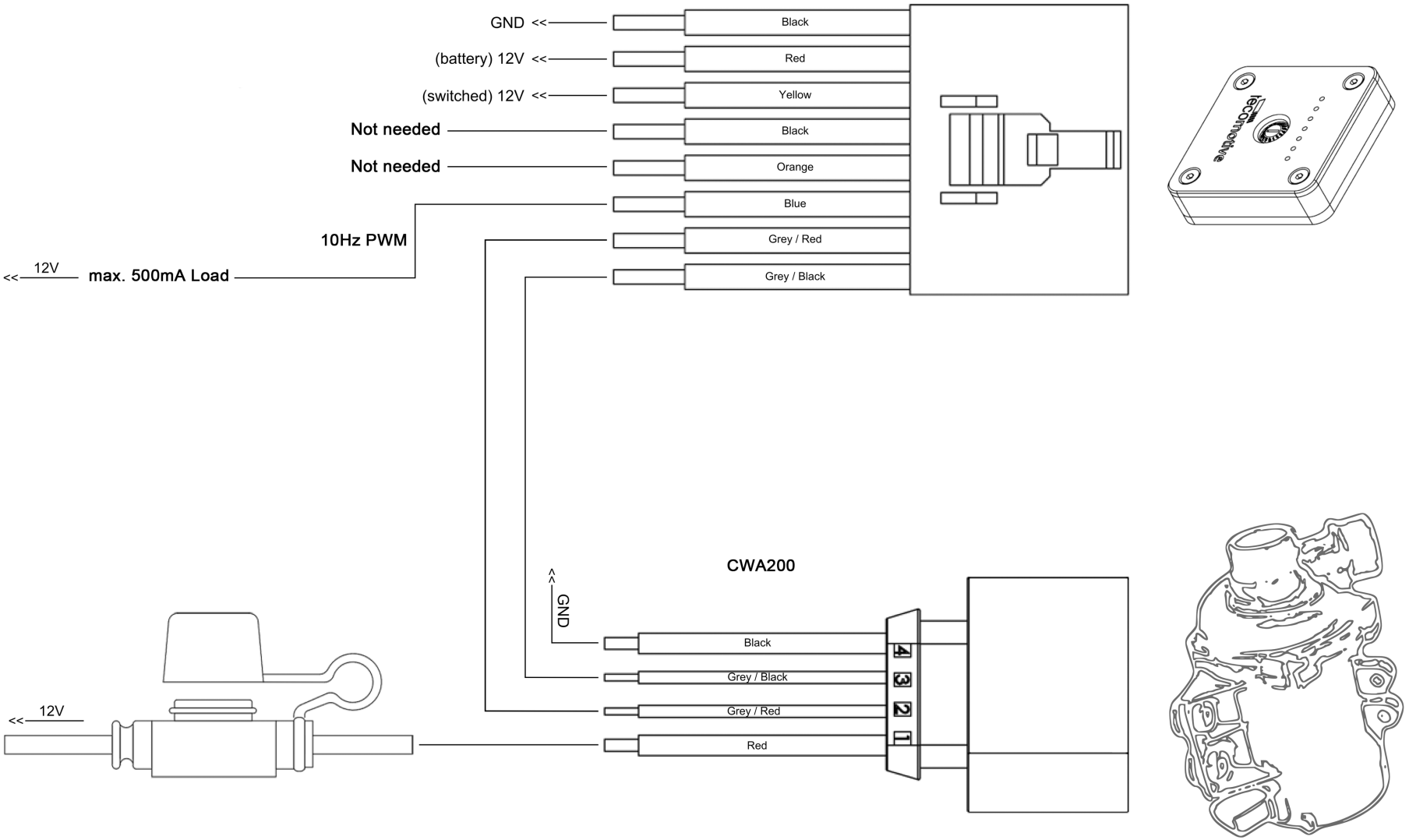
If you drive your car without proper legality and permissions you could lose your insurance coverage and could be committing a criminal offence.

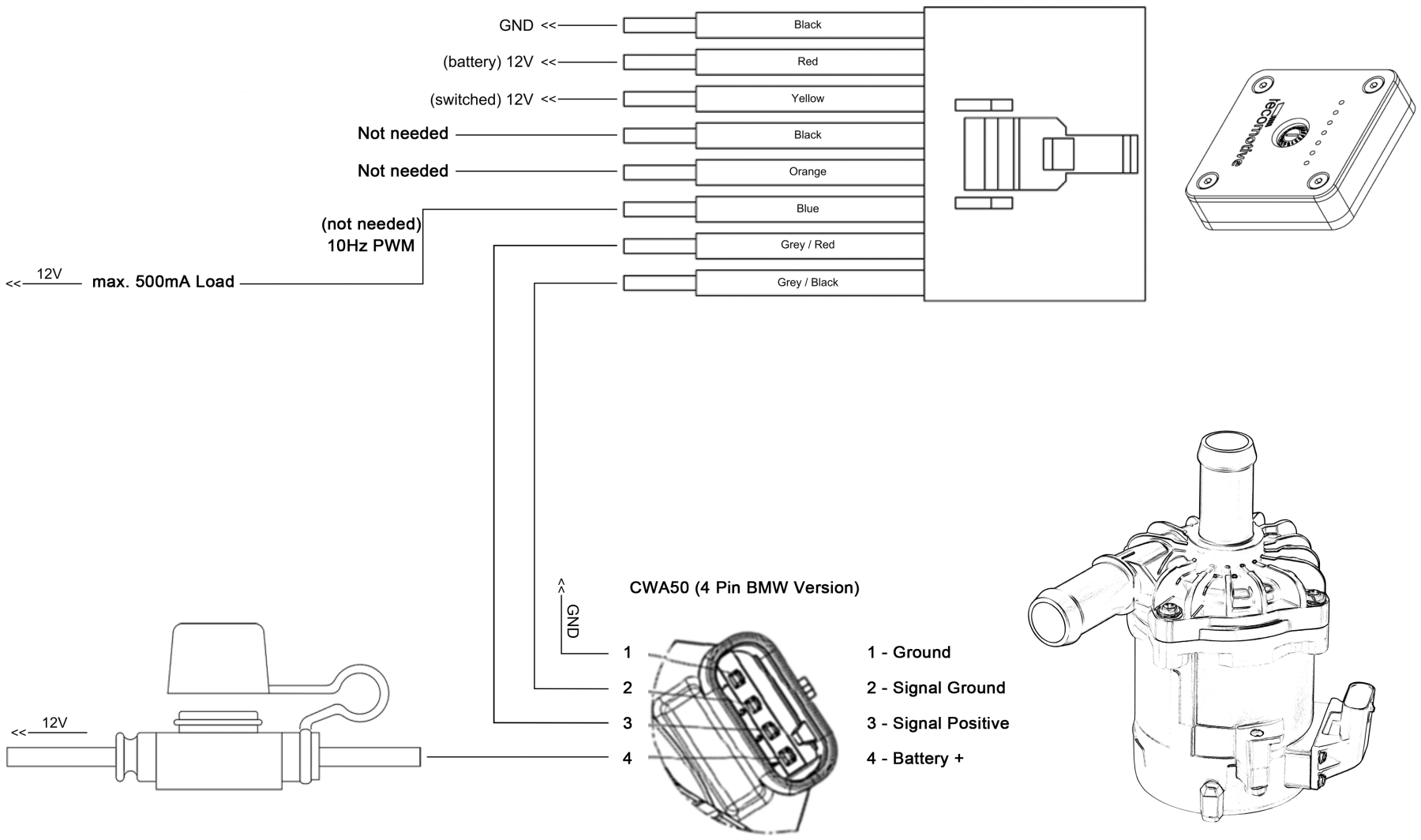
Current consumption over longer periods of time

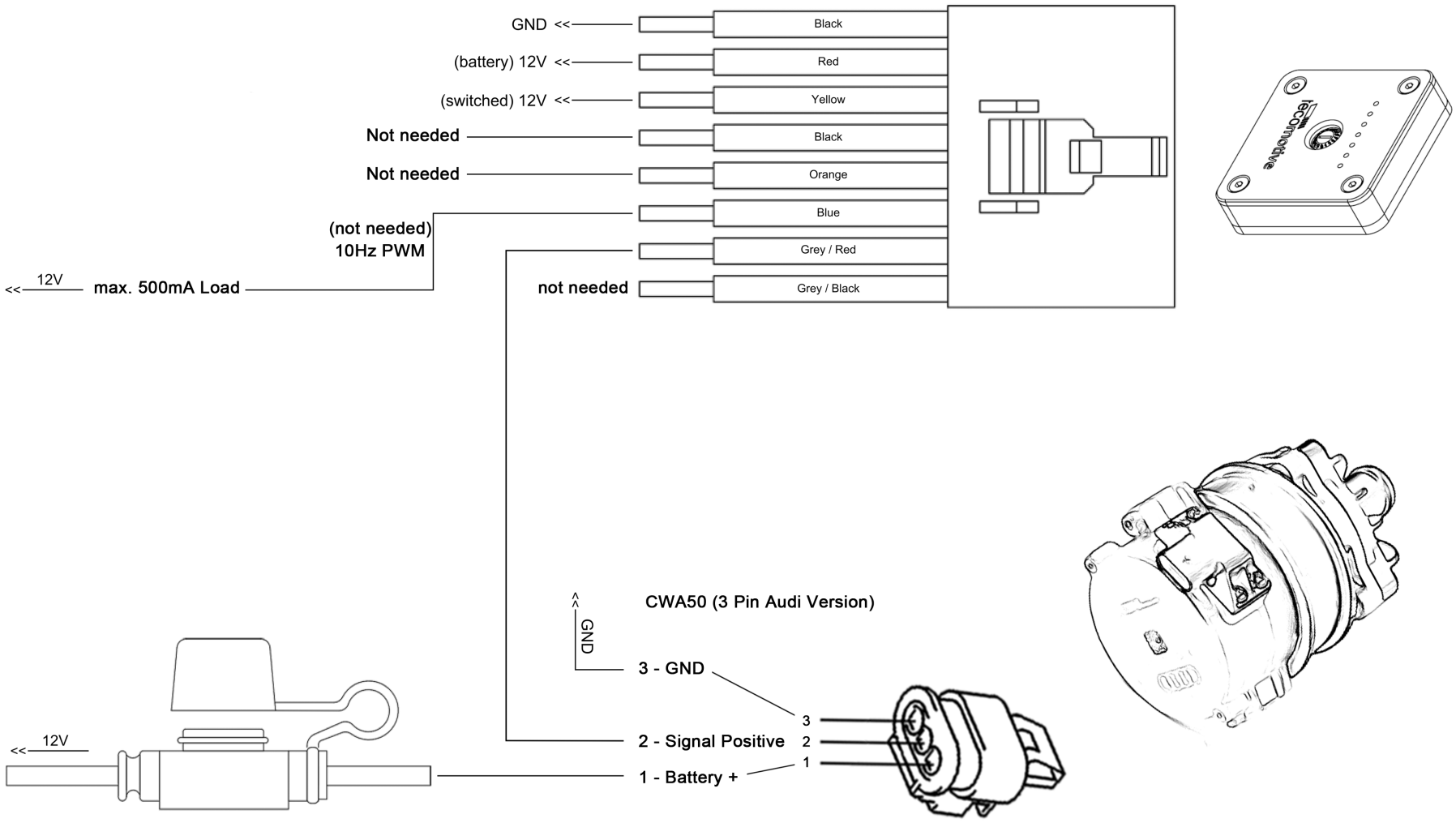
The devices are consuming a little bit of current even in standby mode.
If you don't use them over a longer period of time it is recommended to disconnect them entirely to not damage the cars battery.

Application

The device described in this manual is only tested with the water pump "CWA200" made by the "Pierburg Pump Technology GmbH" which is available at the replacement department of the "BMW AG".
A functional guarantee can only be given by using this product.


GND <<
(battery) 12V <<
(switched) 12V <<
Not needed
Not needed
10Hz PWM
<< 12V
max. 500mA Load
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
CWA200
GND
Black
Grey / Black
Grey / Red
Red
<< 12V


GND <<
(battery) 12V <<
(switched) 12V <<
Not needed
Not needed
(not needed)
10Hz PWM
<< 12V
max. 500mA Load
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
GND
CWA50 (4 Pin BMW Version)
1
2
3
4
1 - Ground
2 - Signal Ground
3 - Signal Positive
4 - Battery +
<< 12V


GND <<
(battery) 12V <<
(switched) 12V <<
Not needed
Not needed
(not needed)
10Hz PWM
<< 12V
max. 500mA Load
not needed
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
CWA50 (3 Pin Audi Version)
<< GND
3 - GND
2 - Signal Positive
1 - Battery +
3
2
1
<< 12V