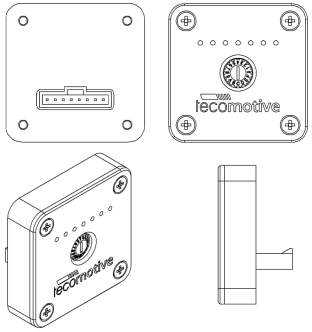
Tecomotive - tinyCWA - User Manual

Manual Version

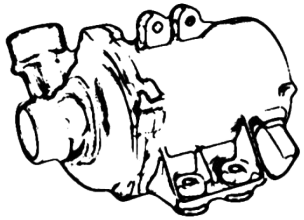
Overview



Contents

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

Introduction



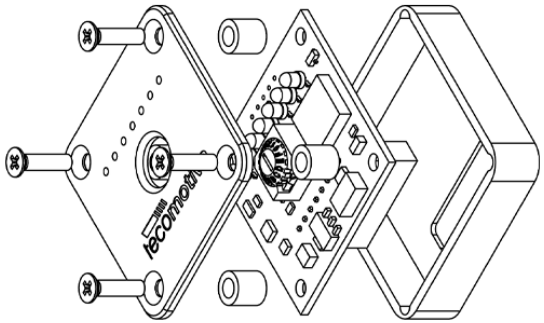
The Pierburg CWA200 was the first electronic water pump for line production introduced by BMW in 2004. They are now widely available in used cars / the aftermarket and have many advantages over conventional mechanical pumps. Some of which are the freedom of installation and the independence of engine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

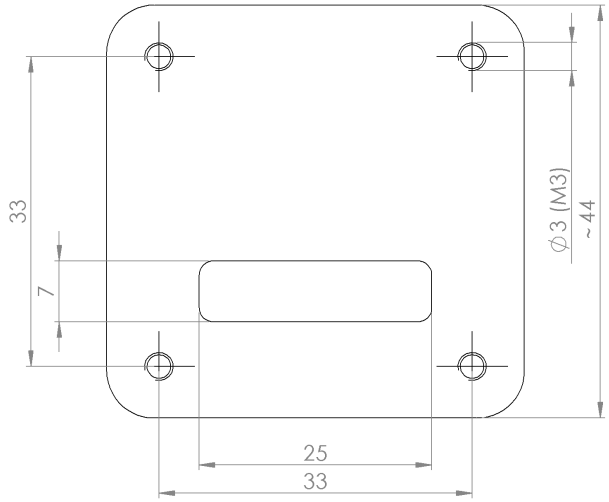
Features

- 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 (400mA max.) output (switching to ground)

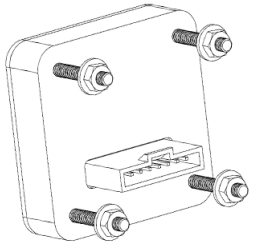


Installation

Installation drawing (mm)



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 screws. (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 …)

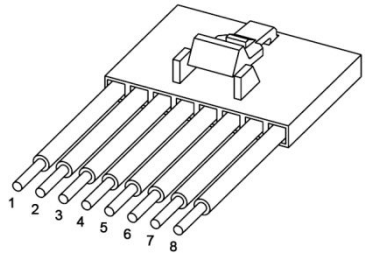
Connection

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 pumps are electronically regulated you should always use the fuse / fuse holder that comes with the kit.

Connector: Controller (8 pin)

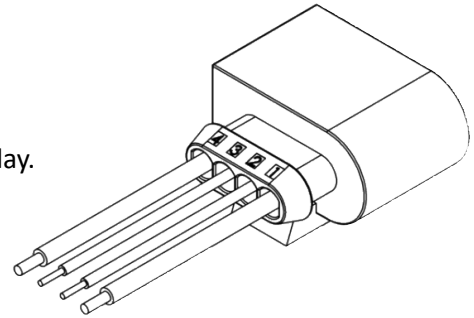
Info: If you do not want any standby functionality you can connect the red wire (pin 2) to the ignition switch, too.

Attention: The 10Hz PWM output can only handle a maximum of 0.4 amps!



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

Connector: Water pump (4 pin)



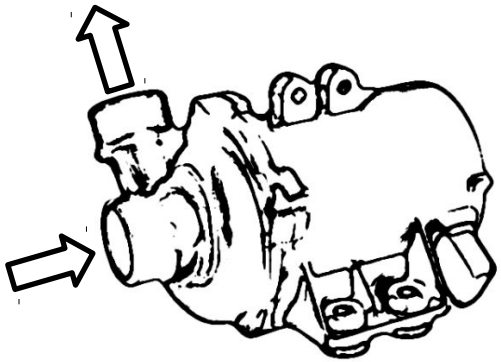
Info: If you do not want to use the standby function you can connect the red wire (pin 1) to a switched relay.

Attention: The main current flows through pin 1 and pin 4. (CWA200) Please only use wires which are able to handle the current!

Possible fuses:
CWA50 7.5A / CWA100 15A / CWA200 15A/30A / CWA400 40A

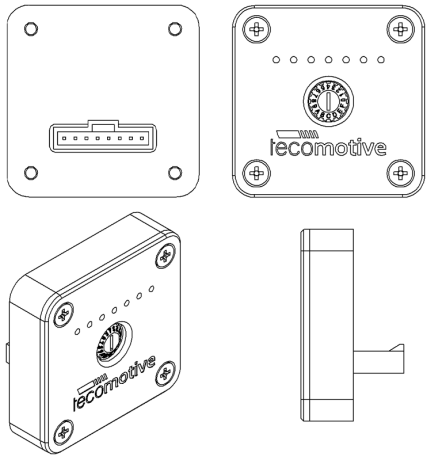
PIN	Color	Connection
1	Red	Battery +12V
2	Grey / Red	Signal wire from controller
3	Grey / Black	Ground wire from controller
4	Black	Ground GND

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 may be helpful 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.)

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 lists.

Program list

CWA50 (approx.)

Position	Speed	Rev/min	Liters/min *	10Hz PWM Duty
0	Stop	0	0 - 0	0%
1	Min.Speed	20	0,1 - 0,1	7%
2	7%	430	2 - 3	13%
3	14%	845	4 - 5	20%
4	21%	1260	5 - 8	27%
5	28%	1670	7 - 10	33%
6	35%	2085	9 - 13	40%
7	42%	2500	11 - 15	47%
8	51%	2900	13 - 18	53%
9	58%	3325	14 - 20	60%
A	65%	3735	16 - 23	67%
B	72%	4150	18 - 25	73%
C	79%	4560	20 - 28	80%
D	86%	4975	21 - 30	87%
E	93%	5390	23 - 33	93%
F	100%	5800	25 - 35	100%

* (depanding on differential pressure)

Program list CWA100 (approx.)

Position	Speed	Rev/min	Liters/min *	10Hz PWM Duty
0	Stop		0 - 0	0%
1	Min.Speed		0,1 - 0,1	7%
2	7%		2 - 3	13%
3	14%		4 - 6	20%
4	21%		7 - 9	27%
5	28%		9 - 12	33%
6	35%		11 - 14	40%
7	42%		13 - 17	47%
8	51%		15 - 20	53%
9	58%		17 - 23	60%
A	65%		19 - 26	67%
B	72%		21 - 29	73%
C	79%		24 - 31	80%
D	86%		26 - 34	87%
E	93%		28 - 37	93%
F	100%		30 - 40	100%

* (depanding on differential pressure)

Program list CWA200 (approx.)

Position	Speed	Rev/min	Liters/min *	10Hz PWM Duty
0	Stop	0	0 - 0	0%
1	Min.Speed	20	0,5 - 0,75	7%
2	7%	340	9 - 13	13%
3	14%	660	17 - 24	20%
4	21%	980	25 - 36	27%
5	28%	1300	34 - 48	33%
6	35%	1620	42 - 60	40%
7	42%	1940	50 - 72	47%
8	51%	2260	58 - 83	53%
9	58%	2580	67 - 95	60%
A	65%	2900	75 - 107	67%
B	72%	3220	83 - 119	73%
C	79%	3540	91 - 131	80%
D	86%	3860	100 - 142	87%
E	93%	4180	108 - 154	93%
F	100%	4500	116 - 166	100%

* (depanding on differential pressure)

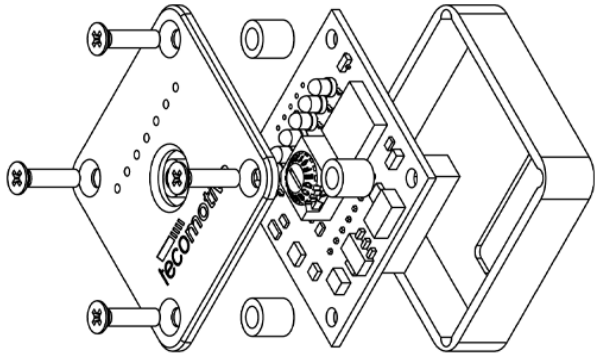
Program list CWA400 (approx.)

Position	Speed	Rev/min	Liters/min *	10Hz PWM Duty
0	Stop	0	0 - 0	0%
1	Min.Speed	20	0,5 - 0,75	7%
2	7%	440	11 - 16	13%
3	14%	860	22 - 32	20%
4	21%	1280	33 - 48	27%
5	28%	1700	43 - 63	33%
6	35%	2120	54 - 79	40%
7	42%	2540	65 - 95	47%
8	51%	2960	75 - 110	53%
9	58%	3380	86 - 126	60%
A	65%	3800	97 - 142	67%
B	72%	4220	107 - 157	73%
C	79%	4640	118 - 173	80%
D	86%	5060	129 - 189	87%
E	93%	5480	139 - 204	93%
F	100%	5900	150 - 220	100%

* (depanding on differential pressure)

Specifications Controller

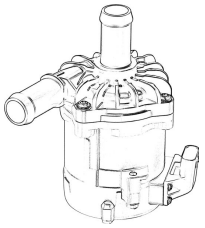
Name:	Tecomotive „tinyCWA“
Dimensions:	about 44x44x12mm (without connector) about 44x44x24mm (with connector)
Operating voltage:	8 to 16 Volts
Current consumption:	20mA max. about 1.5mA in standby mode
Temperature range:	-40°C to +100°C (-40°F to +212°F)
Weight:	about 40 grams (1.4 ounces)



Specifications water pumps

CWA50

Name:	Pierburg „CWA50“
Dimensions:	about 100x100x123mm
Operating voltage:	8 to 16 Volt
Current consumption:	6.5A max. about 0.2mA in standby mode
Speed:	20 bis 5800 rpm
Nominal diff. pressure:	0.55 bar
Flow rate:	25 l/min @ 0.6 bar / 35 l/min @ 0.3 bar
Temperature range:	-40°C to +140°C
Protection:	IP67

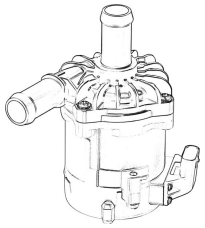


Part numbers:

Pierburg:	7.01360.15.0 / 7.06033.15.0 / . . .
BMW:	11 51 7 566 335 / . . .
Audi:	8K0965567B / 8K0965569 / . . .

CWA100

Name:	Pierburg „CWA100“
Dimensions:	about 100x100x123mm
Operating voltage:	8 to 16 Volt
Current consumption:	13.5A max. about 0.2mA in standby mode
Nominal diff. pressure:	0.85 bar
Flow rate:	30 l/min @ 0.85 bar / 40 l/min @ 0.65 bar
Temperature range:	-40°C to +140°C
Protection:	IP67

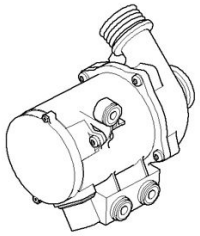


Part numbers:

Pierburg:	7.06754.05.0 / . . .
Mercedes:	A 000 500 04 86 / . . .

CWA200

Name: Pierburg „CWA200“



Dimensions: about 100x125x175mm

Operating voltage: 8 to 16 Volt
Current consumption: 16.5A max. (typical 15A)
about 0.2mA in standby mode

Speed: 20 to 4500 rpm
Nominal diff. Pressure: 0.45 bar
Flow rate: 116 l/min @ 0.45 bar / 166 l/min @ 0.3 bar
Temperature range: -40°C to +140°C
Protection: IP67

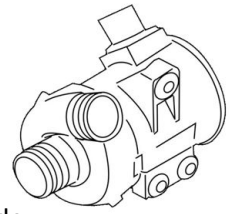
Part numbers:

Pierburg: 7.00294.17.0 / 7.02478.40.0
7.02478.22.0 / 7.00294.15.0
7.02851.20.8 / 7.02851.20.0

BMW: 11 51 7 586 925 / 11 51 7 563 183
11 51 7 546 994 / 11 51 7 521 584
11 51 7 545 201 / 11 51 7 586 924
11 51 7 586 929 / 11 51 7 583 836
11 51 7 586 928 / . . .

CWA400

Name: Pierburg „CWA400“



Dimensions: about 100x125x175mm

Operating voltage: 8 to 16 Volt
Current consumption: 36A max.
about 0.2mA in standby mode

Speed: 20 to 6000 rpm
Nominal diff. Pressure: 0.85 bar
Flow rate: 150 l/min @ 0.85 bar / 220 l/min @ 0.55 bar
Temperature range: -40°C to +140°C
Protection: IP67

Part numbers:

Pierburg: 7.03665.66.0 / 7.02881.66.0
7.02881.31.0 / . . .

BMW: 11 51 7 604 027 / 11 51 8 635 090
11 51 7 596 763 / 11 51 8 635 089

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.

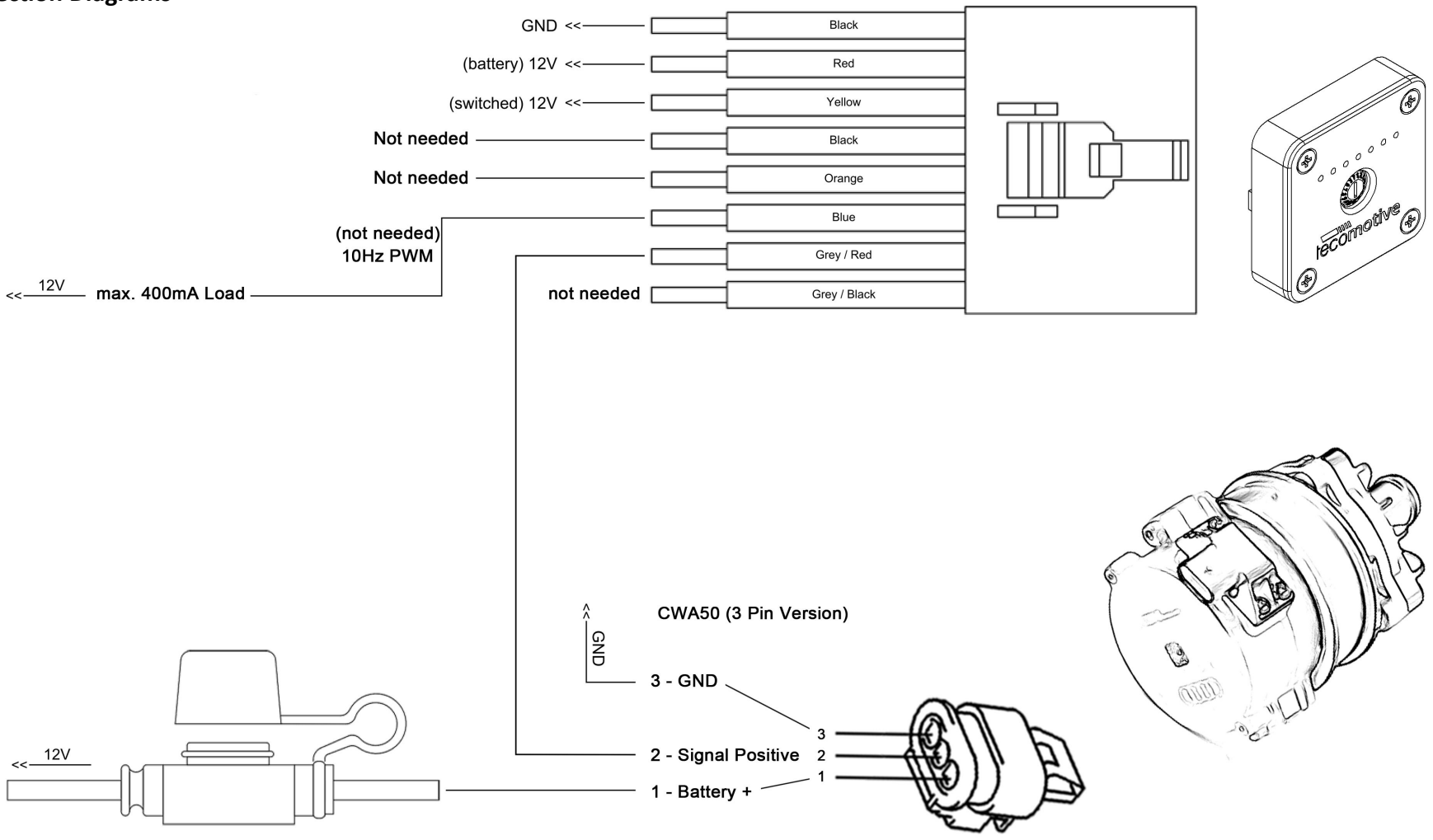
Current consumption over longer periods of time

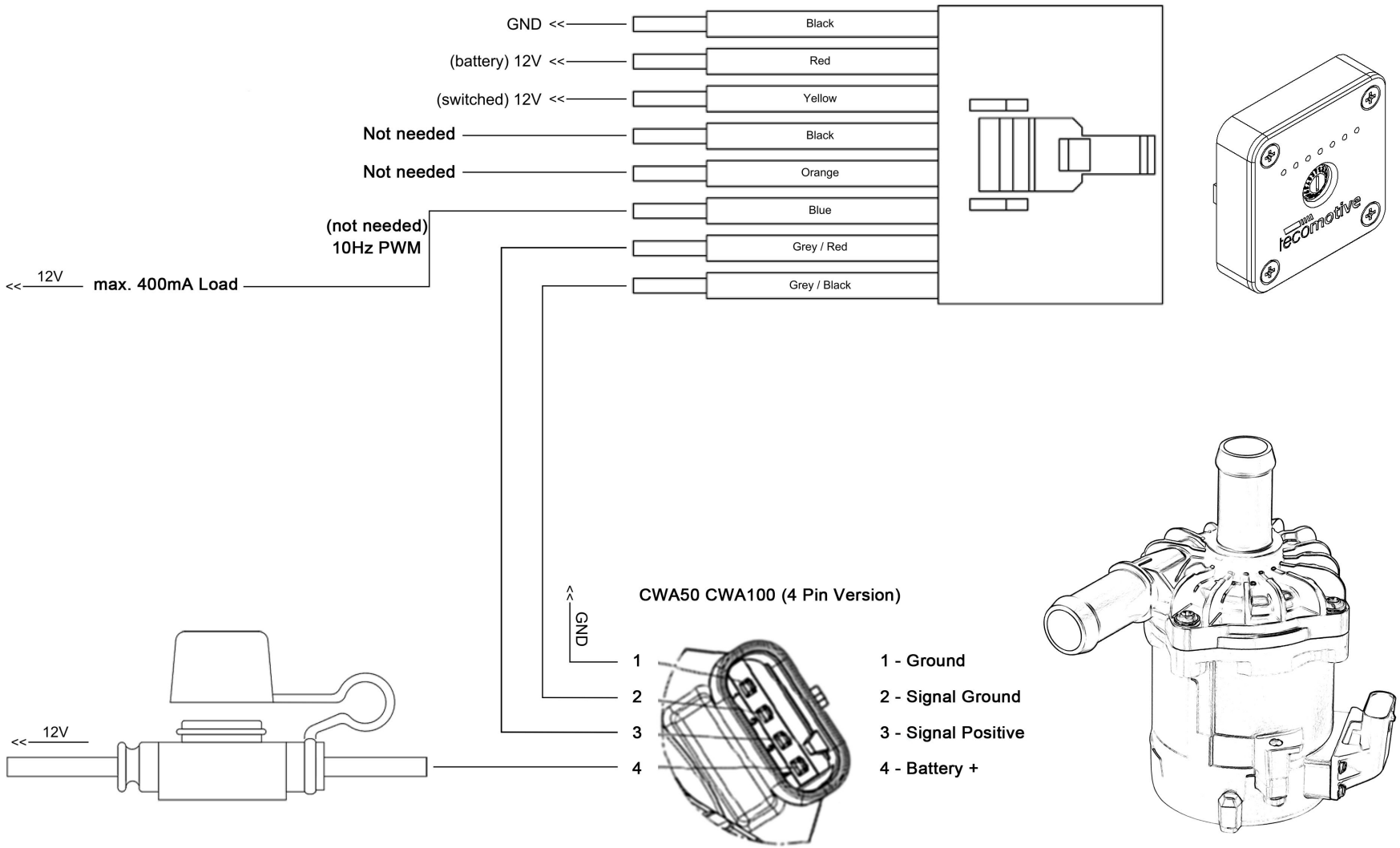
The devices are consuming a little bit of current even in standby mode.
If you don't use them over a longer period of time it is recommended to disconnect them entirely to not damage the cars battery.

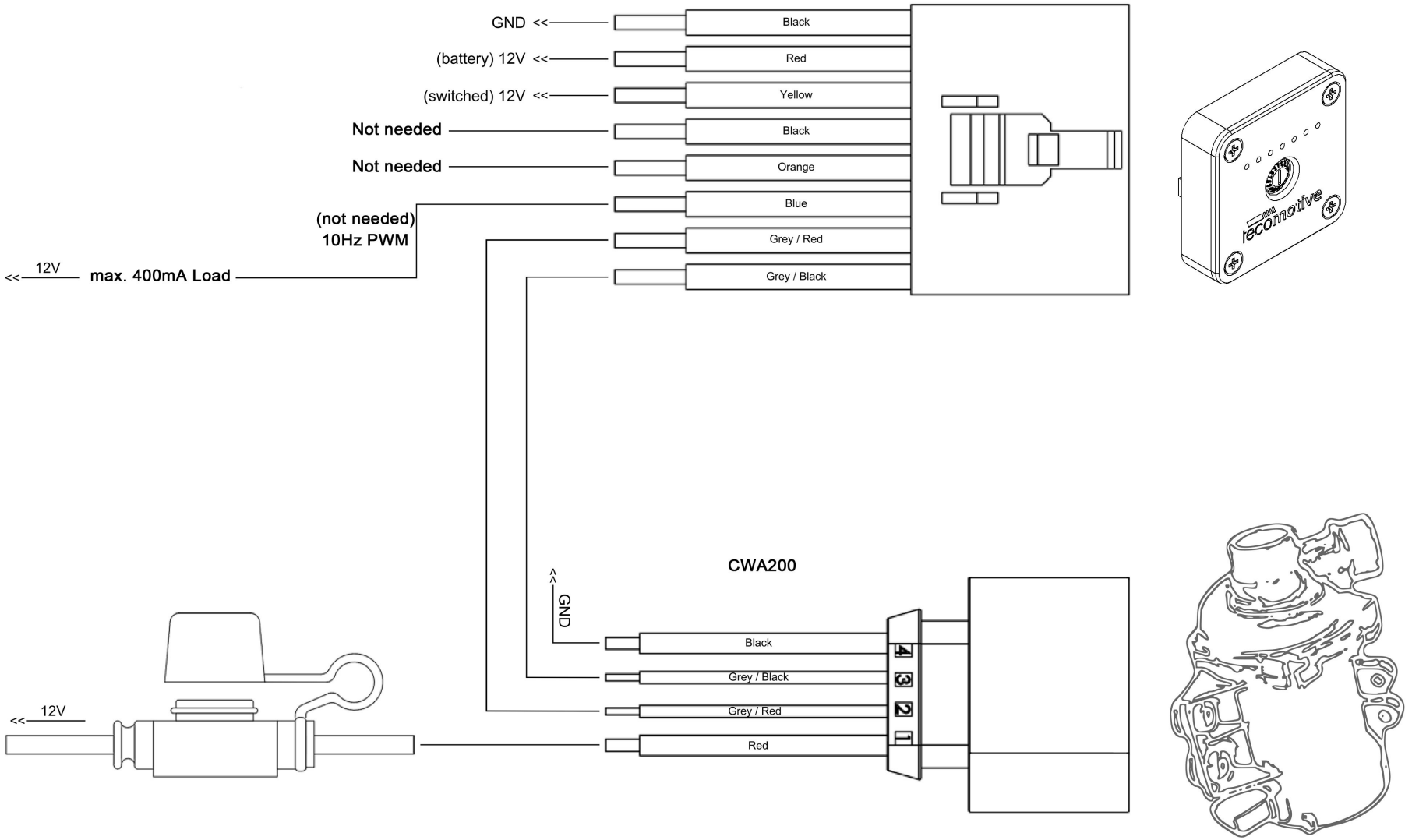
Application

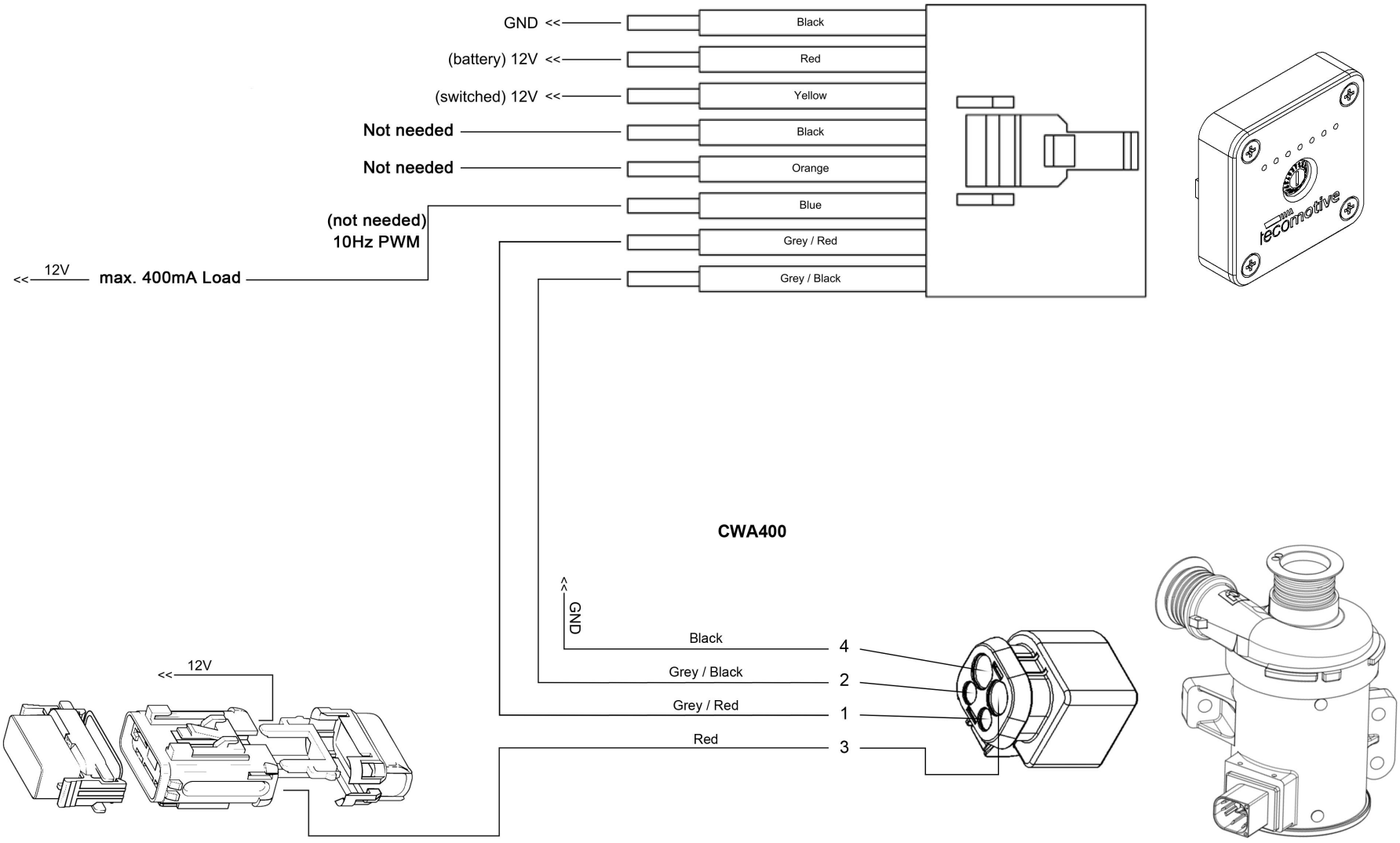
The device described in this manual is only tested with the CWA type water pumps made by the "Pierburg Pump Technology GmbH" which is available at the replacement department of the "BMW AG".
A functional guarantee can only be given by using this products.

Connection Diagrams




GND <<
(battery) 12V <<
(switched) 12V <<
Not needed
Not needed
(not needed)
10Hz PWM
<< 12V
max. 400mA Load
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
tecnomotive
CWA50 CWA100 (4 Pin Version)
GND
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. 400mA Load
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
tecnomotive
CWA200
GND
Black
Grey / Black
Grey / Red
Red
4
3
2
1
<< 12V


GND <<
(battery) 12V <<
(switched) 12V <<
Not needed
Not needed
(not needed)
10Hz PWM
<< 12V
max. 400mA Load
Black
Red
Yellow
Black
Orange
Blue
Grey / Red
Grey / Black
CWA400
<< GND
Black
Grey / Black
Grey / Red
Red
4
2
1
3
<< 12V