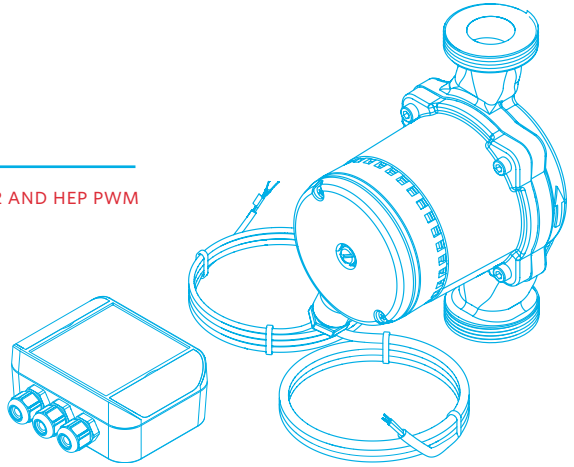
ARMSTRONG

HEP BB2

BABELBOX BB2 AND HEP PWM



EN Installation manual

FILE NO: 11.208A
DATE: SEPTEMBER 2018
SUPERSEDES: NEW
DATE: NEW

Comply with the safety instructions of the product documentation included with delivery.

DANGER!

RISK OF ELECTROCUTION.

Never touch live electrical components and contacts!

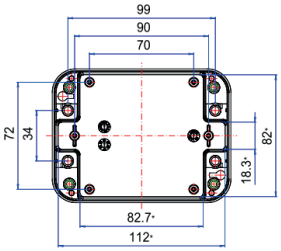
The system must only be operated if it is in flawless technical condition. Faults and damage that adversely affect safety must be remedied by qualified engineers immediately.

INSTALLATION:

- Installation and startup of the heating control and accessory parts must only be performed by qualified electricians as specified by DIN EN 50110-1.
- The electrical wiring must be installed strictly in accordance with national electrical codes, local codes and regulations.

ASSEMBLY OF BB2:

- Take BB2 out of the package
- Fasten BB2 directly onto the wall
- For wiring see the terminal assignment



ASSEMBLY OF CIRCULATION PUMP:

- See separate operating manual

HEP OPTIMO/OPTIMO BASIC/OPTIMO (N)/... (FILE NO.: 11.202A/11.202H)

If technical changes are made to the components, we assume no warranty for resulting damage!

MODE OF OPERATION:

The BB2 automatically detects if an on-site controller is pulsing the power line via a wave packet or is outputting leading or trailing edge voltage. The BB2 converts this into a PWM signal which is identified by the Armstrong PWM pump. Just like the standard pump previously, its power is also then controlled. An integrated LED shows the presence of voltage from the on-site controller. If a signal from the on-board controller is present, the LED flashes.

USE:

The Babelbox BB2 is designed for use in heating systems in which an on-site controller pulses a standard pump via the power line and this pump is to be replaced by a high-efficiency pump. High-efficiency pumps do not react to a pulsed power line and therefore cannot simply substitute for a standard pump. Interposing the Babelbox BB2 solves this issue while retaining the control functions of the system.

By setting jumpers in the BB2 and in the Armstrong HEP PWM pump, the PWM waveform for heating (PWM1) and solar (PWM2, inverted) can be configured. Factory setting: Jumper closed = PWM2 (solar).

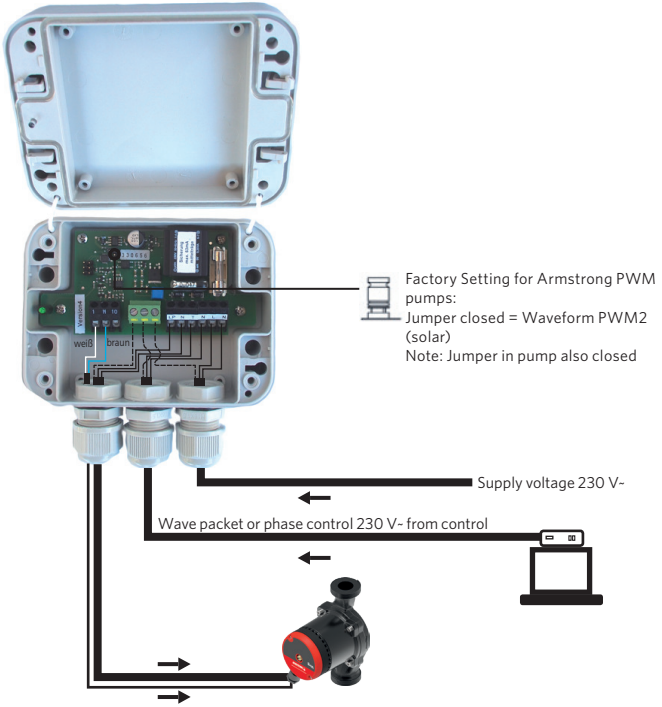
SPECIFICATIONS BABELBOX BB2:

Supply voltage:	230 V
Power input:	0.25 W
Signal input leading edge:	0-230 V
Signal input trailing edge:	0-230 V
Signal input wave packet:	0-230 V, 50 Hz
Signal input power consumption:	1.5 mA
PWM output:	12 V DC, 15 mA
Frequency:	1000 Hz
0-10 V Output:	max. 10.5 V, 10 mA
Ambient temperature:	0 °C to 70 °C
Cable connection input:	3 x M16
Dimensions:	115 x 117 x 50 mm
Weight:	0.3 kg

TERMINAL ALLOCATION:

1	PWM „+“ Signal Armstrong HEP PWM pump (2-wire cable, **white wire**)
M	PWM „OV, GND“ signal Armstrong HEP PWM pump (2-wire cable, **brown wire**)
10	Service function only
Green terminals	PE protective conductor HEP PWM, controller and BB2 (green/yellow)
LP	230 V power supply Armstrong HEP PWM pump (**brown**)
N	Neutral wire for Armstrong HEP PWM pump (blue)
T	230 V control signal from the controller to which the standard pump was connected; pulse package of phase leading edge/trailing edge
N	Neutral wire from the controller to which the standard pump was attached
L	Babelbox 230 V~ power supply
N	Babelbox neutral wire

SCHEMATIC CONNECTION DIAGRAM:



TECHNICAL DATA PUMP:

ECM Technology

TECHNICAL DATA

Rate of flow:	up to 3.8 m³/h
Pressure head:	4 m/7 m
Control range:	4-25 W/4-70 W
Medium temperature:	+2 °C to +110 °C
Installation length:	130 and 180 mm
Threaded connection:	1", 1½" and 2"
Protection class:	IP 42
Insulation class:	F
Control:	PWM1 (heating) and PWM2 (solar, inverted)

PRODUCT FEATURES

- compact design
- manual start-up feature
- smooth running
- very low energy consumption
- starting current limit (softstart)
- air-vent screw
- pre-mounted cable (1 m)*
- space-saving axially integrated terminal box
- control input switchable from PWM1 to PWM2

* other cable lengths on request

FLOW MEDIUM

- heating water as per VDI 2035
- pure, thin, non-aggressive and non-explosive, mineral oil-free medium without solid or long-fibre components
- medium with a max. viscosity of 10 mm²/s
- operating data must be checked above 20% glycol

MATERIALS

COMPONENT	MATERIAL	MATERIAL NO.
Pump housing	Grey-cast iron	0.6020
Impeller	Polyamide (PA - GF 35)	
Shaft	Ceramic	
Bearing	Ceramic	
Bearing plate	Stainless steel	1.4301
Can	Stainless steel	1.4301

TEMPERATURE RANGE

Ambient temperature:	0 °C to +40 °C
Temperature class:	TF 110
Media temperature:	+2 °C to +110 °C

To avoid condensation forming in the terminal box and stator, the media temperature must always be the same or higher than the ambient temperature.

AMBIENT TEMP.	MEDIA TEMP. MIN.	MEDIA TEMP. MAX.
0	2	110
10	10	110
20	20	110
30	30	95
35	35	90
40	40	90

MOTOR PROTECTION

The motor winding is designed to be blocking current-proof. Therefore motor protection is not required.

MINIMUM INFLOW PRESSURE

Please determine the minimum inflow pressure for corresponding temperature from the following table.

Media temperature	< 75 °C	> 90 °C
Minimum inflow pressure	0,05 bar	0,28 bar

CASING PRESSURE

10 bar

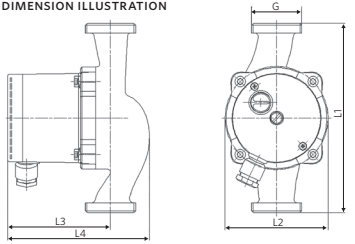
SOUND PRESSURE LEVEL

The sound pressure level is < 45 dB (A).

DIMENSIONS

TYP	L1	L2	L3	L4
HEP PWM	130/180	98	127	163

DIMENSION ILLUSTRATION



MOTOR (HIGH EFFICIENT ECM TECHNOLOGY)

Power supply nominal:	200-230 V, 50-60 Hz
Power consumption:	Version 4 m (4-25 W); Version 7 m (4-70 W)
Power consumption stand-by PWM:	0,8 W

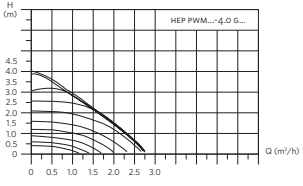
PWM CONNECTION

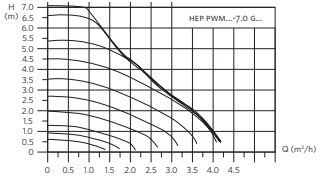
PWM input:	
Frequency f nominal:	100-2000 Hz
Voltage U nominal:	5-24 V
Power PWM to 12 V:	max. 10 mA
Power PWM to 24 V:	max. 20 mA
Insulation voltage optocoupler:	5300 VRMS (T_{in} / T_{pwm}) x 100

STANDARDS

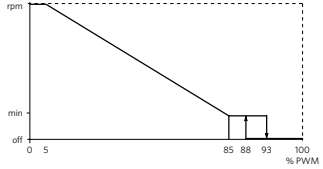
8/37/EG, 2006/95/EG, 2004/108/EG
EN 60335-1, EN 60335-2-51,
EN 55014-1:2006+A1:2009,
EN 55014-2:1997+A1.2001+A2:2008
EN 61000-6:2007, EN 61000-6-3:2007,
EN 50366, EN 61000-3-2, EN 61000-3-3,
EN 55014-1, EN 55014-2

PERFORMANCE CURVES

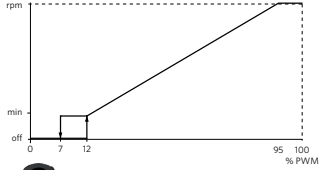




WAVEFORM PWM1 (HEATING)



WAVEFORM PWM2 (SOLAR)



TECHNICAL DATA

TYPE	CONNECTION PIPE	THREADED CONNECTION	INSTALLATION LENGTH (MM)	P1 (W)	I_{MAX} (A)	NETTO-GEWICHT (KG)
HEP BB2 25-4.0 G180	1"	1 ½"	180	4...25	0,3	3,0
HEP BB2 25-7.0 G180	1"	1 ½"	180	4...66	0,6	3,0
HEP BB2 30-4.0 G180	1 ¼"	2"	180	4...25	0,3	3,1
HEP BB2 30-7.0 G180	1 ¼"	2"	180	4...66	0,6	3,1
HEP BB2 15-4.0 G130	1/2"	1"	130	4...25	0,3	3,0
HEP BB2 15-7.0 G130	1/2"	1"	130	4...66	0,6	3,0
HEP BB2 25-4.0 G130	1"	1 ½"	130	4...25	0,3	3,0
HEP BB2 25-7.0 G130	1"	1 ½"	130	4...66	0,6	3,0

EU-Konformitätserklärung / EC Declaration of Conformity

Der Hersteller: / The manufacturer:

ARMSTRONG FLUID TECHNOLOGY GmbH
Westerbachstr. 28
61476 Kronberg im Taunus
Germany

erklärt hiermit, dass die Produkte: / herewith declares that the products:

HEP PWM / HEP BB2

den Bestimmungen der folgenden Richtlinien in ihrer jeweils gültigen Fassung entsprechen: /
are in conformity with the provisions of the following directives in their currently valid versions:

- Niederspannungs-Richtlinie / Low-voltage directive 2014/35/EU
- Elektromagnetische Verträglichkeits-Richtlinie / Electromagnetic compatibility directive 2014/30/EU
- Öko-Design-Richtlinie / Ecodesign directive 2009/125/EC, No. 641/2009/EC + 622/2012/EC

wenn die Installation, der Betrieb, und die Wartung ordnungsgemäß durchgeführt wird. /
when the installation, operation and maintenance instructions are adhered to.

Weiterhin erklärt der Hersteller, dass die folgenden harmonisierten internationalen Normen zur Anwendung kamen: / The manufacturer also declares that the following harmonised international standards have been applied:

- DIN EN 60335-1 (2012/10)
- DIN EN 60335-2-51 (2012/08)
- DIN EN 55014-1 (2016/09)
- DIN EN 55014-2 (2016/01)
- DIN EN 61000-3-2 (2015/03)
- DIN EN 61000-3-3 (2014/03)
- DIN EN 16297-1 (2013/04)
- DIN EN 16297-2 (2013/04)

Die EU-Konformitätserklärung wurde ausgestellt: /
The EC Declaration of Conformity was issued on:

Frankfurt, 24.07.2018

Robert Dietrich, Geschäftsführer / Managing director

ARMSTRONG FLUID TECHNOLOGY GmbH
Westerbachstr. 28
61476 Kronberg im Taunus
Germany

FOR MORE INFORMATION, CONTACT YOUR ARMSTRONG REPRESENTATIVE OR VISIT US AT:

ARMSTRONGFLUIDTECHNOLOGY.COM/CONTACTUS

TORONTO, CANADA
+1 416 755 2291

BUFFALO, USA
+1 716 693 8813

SÃO PAULO, BRAZIL
+55 (11) 4781 5500

BIRMINGHAM, UK
+44 (0) 8444 145 145

MANCHESTER, UK
+44 (0) 8444 145 145

LYON, FRANCE
+33 (0) 420 102 625

MANNHEIM, GERMANY
+49 (0) 621 3999 9858

DUBAI, UAE
+971 4 8876775

BANGALORE, INDIA
+91 (0) 80 4906 3555

SHANGHAI, CHINA
+86 (0) 21 3756 6696

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