Circulator for OEMs

Calio SI HP

Type Series Booklet



KSB

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Type Series Booklet Calio SI HP

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Building Services: Heating

Variable Speed Circulator Pumps

Calio SI HP



Main applications

- Heating systems
- Ventilation systems
- Air-conditioning systems
- Circulation systems
- One-pipe systems and two-pipe systems
- Underfloor heating systems
- Boiler circuits or primary circuits
- Storage tank circuits
- Solar power systems
- Heat pumps

Fluids handled

- Heating water to VDI 2035. If the glycol content equals or exceeds 20 %, check and verify the operating data.
- Pure, thin, non-aggressive, non-explosive and non-gaseous fluids not containing any mineral oil, solids or long fibres
- Fluids with a viscosity of max. 10 mm²/s

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m³/h]	≤ 8,0
	Q [l/s]	≤ 2,2
Head	H [m]	≤ 8,0
Fluid temperature	T [°C]	-10 to +110
Ambient temperature	T [°C]	0 to +55
Operating pressure	p [bar]	≤ 10[1)]
Sound pressure level	[dB (A)]	< 30
Connection	G	1 $^{1}/_{2}$, 2

Design details

Design

- Maintenance-free high-efficiency wet rotor pump (glandless)

Drive

- Brushless permanent magnet motor, self-cooling
- 1~230 V AC
- Frequency 50 Hz/60 Hz
- Starting current 1.5 A
- Enclosure IP44
- Thermal class F
- Temperature class TF 110
- Energy efficiency index EEI ≤ 0.20
- Interference emissions EN 55014-1
- Interference immunity EN 55014-2
- IEC 60335-2-51

Bearings

- Ceramic bearings

Connections

- Screw-ended

Operating modes

- Operation controlled by external input (PWM signal or 0 - 10 V)[2)]
- Constant-pressure control
- Proportional-pressure control
- Setting the operating mode
- Setting the differential pressure setpoint
- Setting the speed level
- Vent function
- Deblocking the rotor

Signalling functions and display functions

- Alternating display of flow rate, head and electrical input power
- Error messages on the display

1 ≤ 16 bar on request
2 Optional

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Designation

Example: Calio SI HP 25-80

Designation key

Code	Description	
Calio SI	Type series	
	HP	High-efficiency circulator pump
25	Connection	
	25	G 1 $^{1}/_{2}$
	30	G 2
80	Head [m]	
	80	Head × 10 Example: 8 m × 10 = 80

Materials

Overview of available materials

Part No.	Description	Material
102	Volute casing	Grey cast iron (EN-GJL-200) with cathodic electrocoating
210	Shaft	Ceramics
230	Impeller	Polyether sulphone, glass fibre reinforced
310	Plain bearing	Ceramics
360	Bearing plate	Stainless steel 1.4301
689	Thermal insulation shell	Polypropylene
817	Can	Stainless steel 1.4301

Casing parts which are in contact with the atmosphere and with the fluid handled are free from paint-wetting impairment materials..

Product benefits

- Maximum savings of operating costs by high-efficiency technology combined with speed control
- Future-proof by maximum energy efficiency, exceeding current energy efficiency regulations such as ErP 2015.
- Easy-to-use combination of controls, integrated display and symbols to show the operating status
- High availability due to manual and integrated protective functions
- Compact dimensions and plug-type connector make the pumps easy to install.

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see http://www.ksb.com/reach.

Certifications

Overview

Label	Effective in:	Comment
	Europe	EEI ≤ 0,20

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Selection information

Minimum inlet pressure

The minimum inlet pressure p_{min} at the pump suction nozzle serves to avoid cavitation noises at an ambient temperature of +40 °C and the indicated fluid temperature T_{max}.

The indicated values are applicable up to 300 m above sea level. For installation at altitudes > 300 m, an allowance of 0.01 bar / 100 m must be added.

Minimum inlet pressure p_{min} specified for the fluid temperature $T_{max.}$

Fluid temperature	Minimum inlet pressure
[°C]	[bar]
≤ 80	0,5
81 to 95	1,5
96 to 110	2,5

Description of the characteristic curve

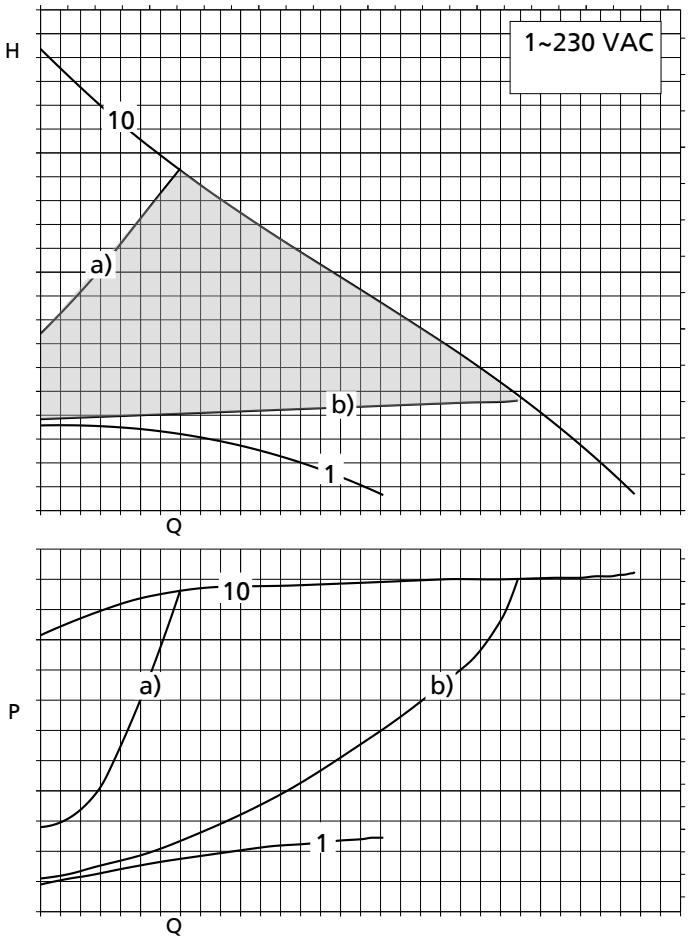


Fig. 1: Selection example

The characteristic curve can be adjusted between a) and b) in increments of 0.1 m by pressing the control keys.

1	Minimum fixed speed operation
10	Maximum fixed speed operation
	Control range
a)	Control curve, maximum head
b)	Control curve, minimum head

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Operation controlled by external input

PWM signal

The pump set communicates with an external control system via a pump-integrated 2-way PWM interface. The pump control system sends the estimated flow rate Q to the external control system and, in return, receives the maximum required differential pressure. Based on the value received, the pump control system adjusts the speed.

More information:

- PWM profile A (heating applications)
- PWM profile C (solar applications)

Operation with PWM profile A (heating applications)

Parameters sent by external control system

Parameter	PWM signal [%]	Comments
Maximum speed	0 - 5	No PWM signal connected: The pump set is operated at maximum speed.
Pump ID	95 - 100	-
Modulation	5 - 90	-
Stand-by	92 - 100	The pump set can also be controlled when in stand-by mode.

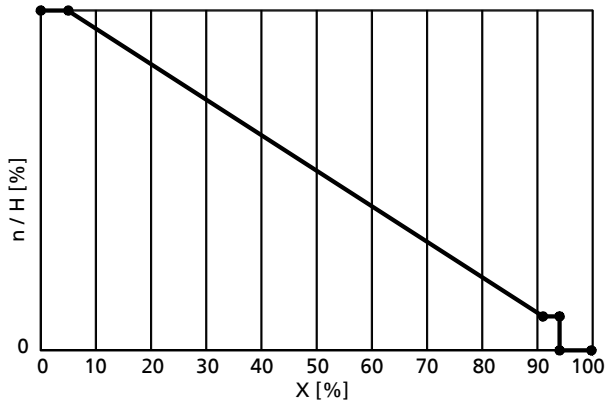


Fig. 2: PWM signal from external control system to pump control system

n	Speed	X	PWM

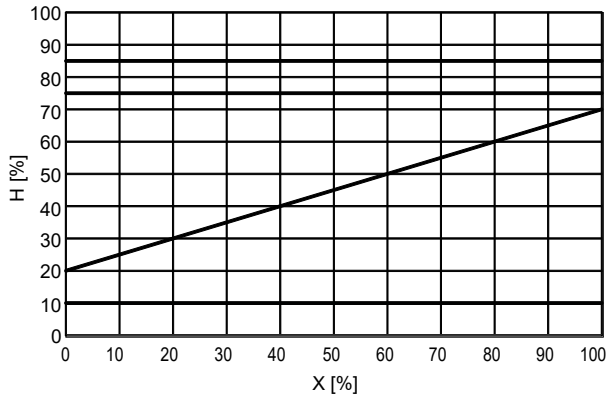


Fig. 3: PWM profile A, PWM signal from pump control system to external control system

H	Head	X	PWM

Parameters sent by pump set

Parameter / function	PWM signal [%]	Comments
Pump ID	85	-
Blocked rotor	75	-
Modulation	20 - 70	Estimated flow rate
Dry running	10	-

Operation with PWM profile C (solar applications)

Parameters sent by external control system

Parameter	PWM signal [%]	Comments
Maximum speed	90 - 94	No PWM signal connected: Pump set stops.
Pump ID	95 - 100	-
Modulation	5 - 90	-
Stand-by	94 - 100	The pump set can also be controlled when in stand-by mode.

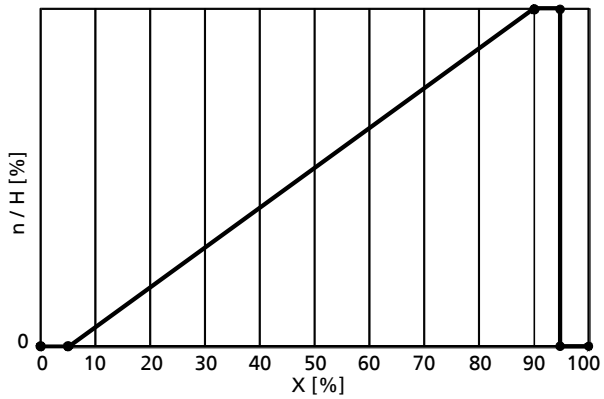


Fig. 4: PWM signal from external control system to pump control system

n	Speed	X	PWM

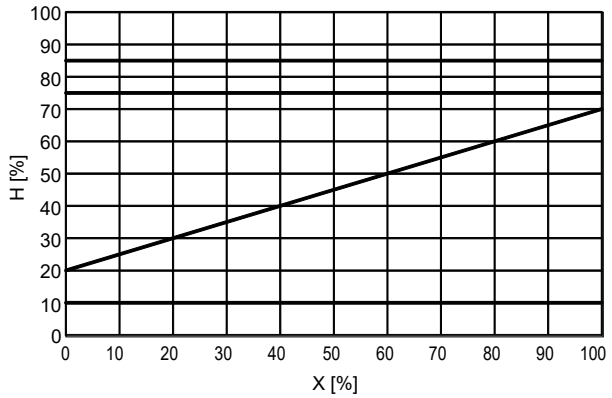


Fig. 5: PWM profile C, PWM signal from the pump to the external control system

n	Speed	X	PWM

Parameters sent by pump set

Parameter / function	PWM signal [%]	Comments
Pump ID	85	-
Blocked rotor	75	-
Modulation	20 - 70	Estimated flow rate
Dry running	10	-

Speeds depending on the size

Size	Speed	
	Minimum [rpm]	Maximum [rpm]
25-80	1000	4000
30-80	1000	4000

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Operation controlled by analog signal 0 - 10 V

Operation of the pump set can be controlled by analog signal (0 - 10 V). For connecting the analog signal 0 to 10 V, use the same terminals as for the PWM signal.

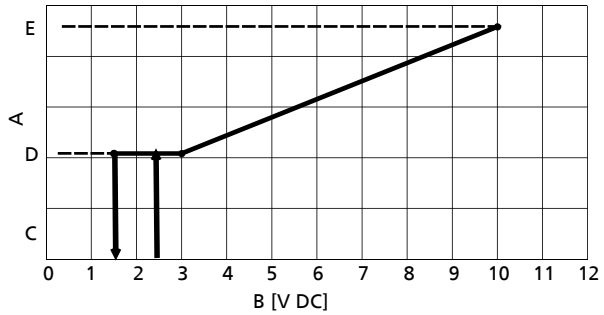


Fig. 6: Operation controlled by analog signal 0 - 10 V

A	Speed [rpm]
B	Voltage of input signal
C	Pump OFF
D	Minimum speed 1000 rpm
E	Maximum speed [rpm]

Speeds depending on the size

Size	Speed	
	Minimum	Maximum
	[rpm]	[rpm]
25-80	1000	4000
30-80	1000	4000

Technical data

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Symbols key

Symbol	Description
✗	Available
-	Not available

Technical data

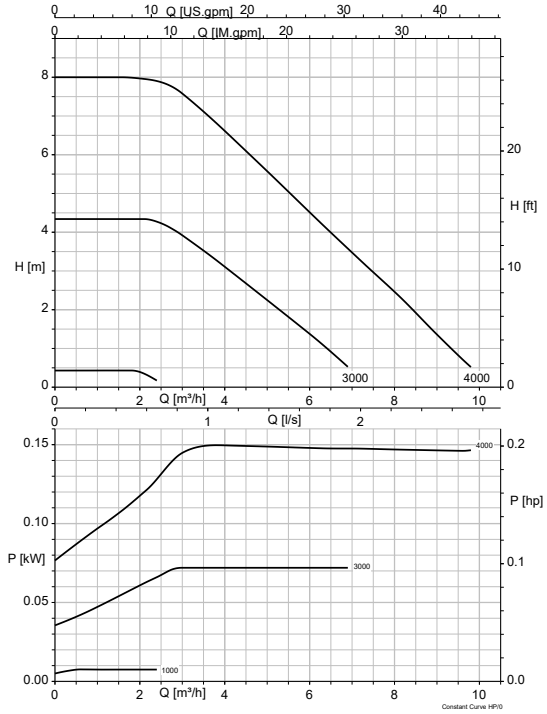
Size	Connection		PN	P_1	Motor protection[3]	Interfaces	I_N	Mat. No.	[kg]
	Piping	Pump	[bar]	[W]			1~230 V AC, 50 / 60 Hz [A]		
25-80	R 1	G 1 $^1/_2$	10[4]	150	✗	PWM / 0 - 10 V	0,01 - 0,10	48242084	4,0
25-80	R 1	G 1 $^1/_2$	10	150	✗	-	0,01 - 0,10	48242086	4,0
30-80	R $^1/_4$	G 2	10	150	✗	PWM / 0 - 10 V	0,01 - 0,10	48242083	4,2
30-80	R $^1/_4$	G 2	10	150	✗	-	0,01 - 0,10	48242085	4,2

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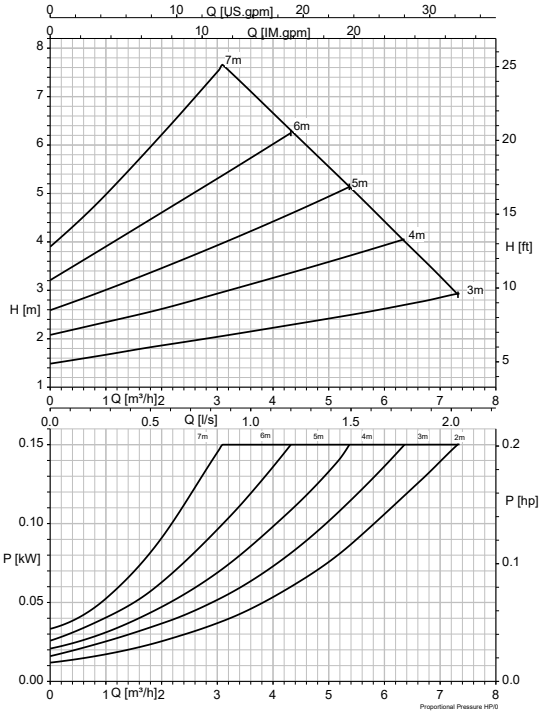
3 Integrated electronic motor protection
4 ≤ 16 bar on request

Characteristic curves

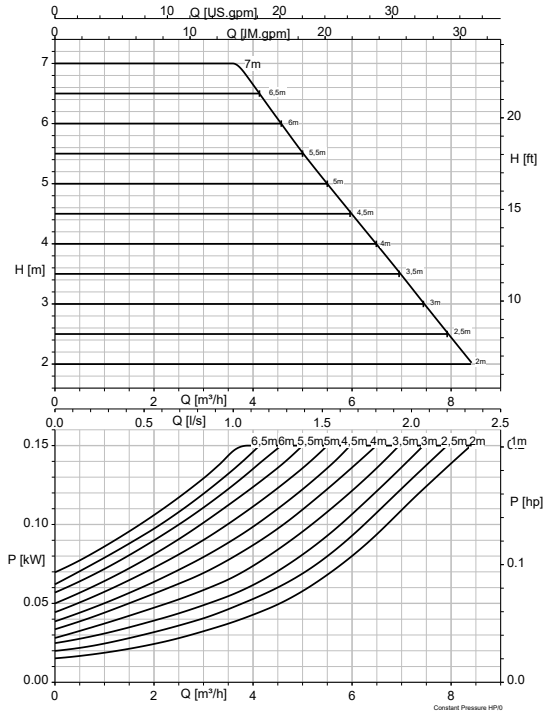
Calio SI HP 25/30-80 open-loop control



Calio SI HP 25/30-80 Δpv



Calio SI HP 25/30-80 Δpc



Dimensions

Calio SI HP dimensions

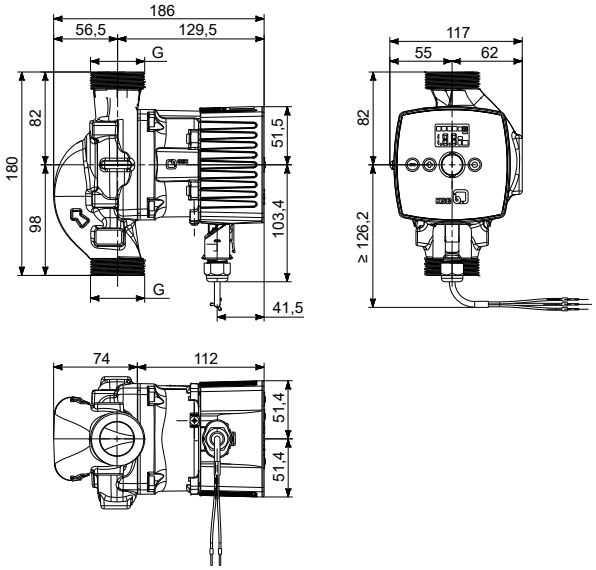


Fig. 7: Pump set dimensions (example)

Pump set dimensions

Size	R	G
25-80	1	1 $^{1}/_{2}$
30-80	1 $^{1}/_{4}$	2

Installation information

Permissible installation positions

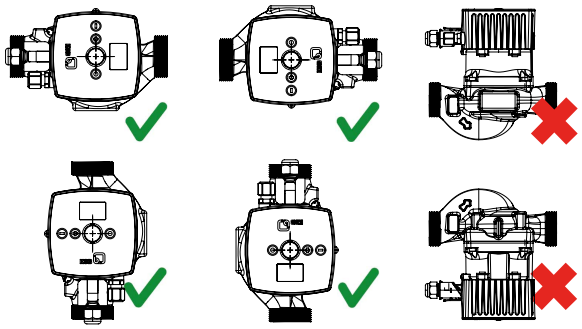


Fig. 8: Permissible installation positions

The pump head with display can be turned as required by the pump's installation position.

Electrical connection

Power cable

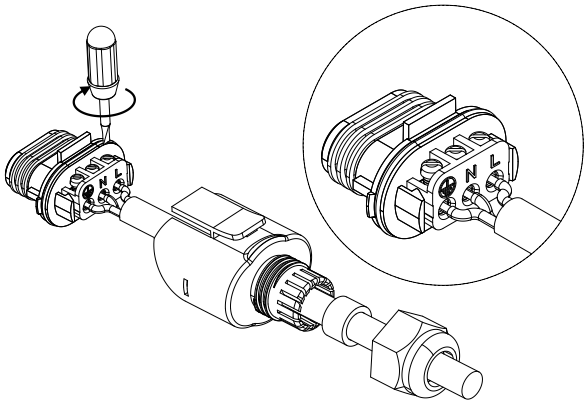


Fig. 9: Connecting the power cable

L	Conductor / phase (230 V)
N	Neutral conductor
⏚	Earthing

Control cable (PWM signal / 0 - 10 V)[5)]

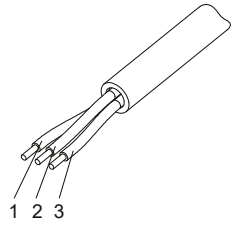


Fig. 10: Connecting the control cable (PWM signal)

1	Connection for PWM signal from pump control system to external control system (brown)
2	Earthing PWM (blue)
3	Connection for PWM signal from pump control system to external control system (black)

Scope of supply

- Pump set

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5 For Calio SI HP 25-80, 30-80 with PWM / 0 - 10 V interface only

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