

High-efficiency Circulator Pump

## Calio S / Calio S BMS

### Type Series Booklet



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Type Series Booklet Calio S / Calio S BMS

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## Building Services: Heating

### Variable Speed Circulator Pumps

# Calio S / Calio S BMS



#### 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 mm<sup>2</sup>/s

#### Operating data

##### Operating properties

Characteristic	Value		
	Calio S	Calio S BMS	
Flow rate	Q [m <sup>3</sup> /h]	≤ 3,5	≤ 7
	Q [l/s]	≤ 1,0	≤ 1,5
Head	H [m]	≤ 6	
Fluid temperature <sup>1)</sup>	T [°C]	≥ +2	≥ -10
		≤ +95	≤ +110
Ambient temperature	T [°C]	≥ 0	
		≤ +40	
Operating pressure	p [bar]	≤ 10	
Sound pressure level	[dB (A)]	≤ 30	
Piping connection	Rp	1/2 - 1 1/4	

#### Design details

##### Design

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

##### Drive

- High-efficiency permanent magnet synchronous motor, brushless, self-cooling, with continuously variable differential pressure control
- 1~230 V AC +/- 10%
- Frequency 50 Hz/60 Hz
- Thermal class F
- Energy efficiency index EEI ≤ 0.20

##### Calio S:

- IP42 enclosure
- Temperature class TF 95
- Interference emissions EN 55014-1
- Interference immunity EN 55014-2
- Interference immunity EN 60335-2-51

##### Calio S BMS:

- Enclosure IP44
- Temperature class TF 110
- Interference emissions EN 61000-6-3
- Interference immunity EN 61000-6-1

#### Bearings

##### Calio S:

- Ceramic bearings

##### Calio S BMS:

- Product-lubricated special plain bearing

#### Connections

- Screw-ended

#### Operating modes

##### Calio S:

1) To prevent condensation in the terminal box and stator, the fluid temperature must always be equal to or higher than the ambient temperature.

- Automatic mode with constant-pressure control or proportional-pressure control
- Fixed speed operation with three speed levels

**Calio S BMS:**

- Automatic mode with constant-pressure control or proportional-pressure control, Eco Mode, Boost Mode

**Automatic functions**
**Calio S:**

- Continuously variable speed adjustment depending on the mode of operation
- Soft start (limitation of starting current)
- Full motor protection with integrated trip electronics
- Setback operation

**Calio S BMS:**

- 0 - 10 V with external differential pressure/speed setpoint
- External start/stop
- General fault message

**Manual functions**
**Calio S:**

- Setting the operating mode
- Setting the differential pressure setpoint
- Setting the speed level
- Vent function
- Deblocking the rotor

**Calio S BMS:**

- Self-venting function
- Automatic deblocking function (pump starts at maximum torque and current limitation with an unlimited number of start-up attempts)

**Signalling and display functions**

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

**Designation**
**Example: Calio S 25-40-130**
**Designation key**

Code	Description	
Calio S	Type series	
25	Connection	
	15	Rp 1/2
	25	Rp 1
40	Head H [m]	
	40	Head × 10 (example: 4 m × 10 = 40)
	Overall length	
130	130	130 mm
	_)	See dimensions.
	Building Management System	
BMS	BMS	With BMS function
	_)	Without BMS function

**Materials**
**Overview of available materials**

Part number	Component	Material	
		Calio S	Calio S BMS
102	Volute casing	Grey cast iron with cathodic electrocoating	
210	Shaft	Ceramics	Stainless steel 1.4034
230	Impeller	Polyether sulphone (PES)	Plastic with glass fibre content (PSU-GF30)
310	Bearings	Ceramics	Ceramics/carbon
360	Bearing plate	Stainless steel 1.4301	
817	Can	Stainless steel 1.4301	
689	Thermal insulation shell	Polypropylene	

2) Blank

### 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.

### Calio S


- Easy to use with a combination of control keys, integrated display and symbols showing the operating status
- High availability due to manual and integrated protective functions
- Compact dimensions and KSB plug make the pumps easy to install.

### Calio S BMS

- Simple to set with turn&press dial combined with an integrated display and symbols indicating the operating mode
- Integrated 0 - 10 V DC, External Start/Stop and General Fault Message functions
- New Eco Mode enables additional savings of more than 40 % compared to proportional-pressure control.

### Certifications

#### Overview

Label	Effective in:	Comment
	Europe	EEl ≤ 0,20

### 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.

#### Calio S

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

Fluid temperature	Minimum inlet pressure
[°C]	[bar]
5 to 75	0,05
76 to 95	0,4

#### Calio S BMS

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

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

Description of the characteristic curve

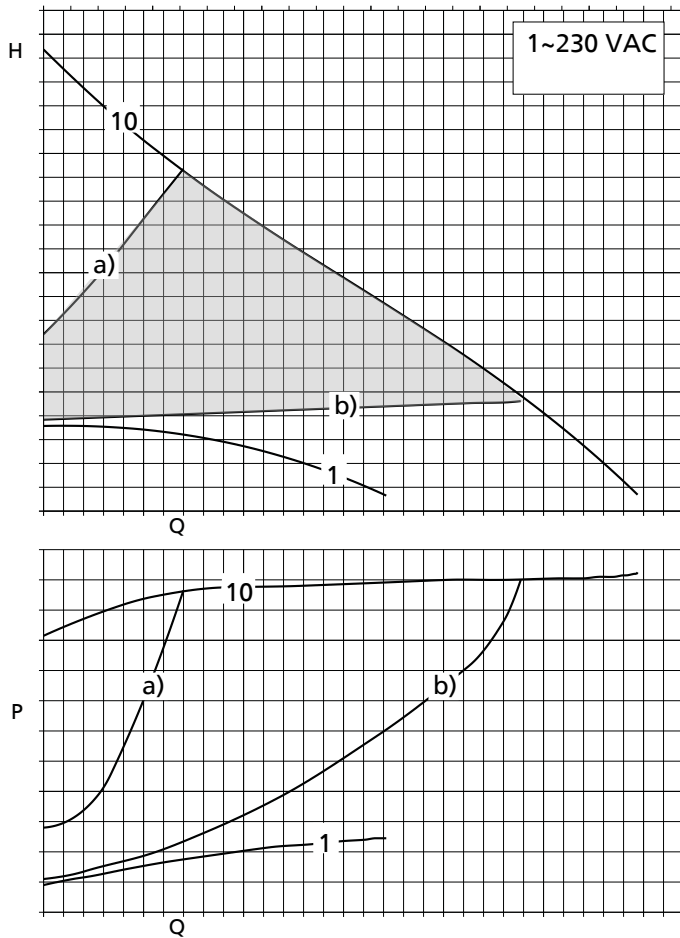


Fig. 1: Selection example

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

**Overview of product features / selection tables**
**Features and functions**

Symbols key

Symbol	Description
X	Version available
-	Version not available / not feasible

Features and functions

Functions	Calio S	Calio S BMS
<b>Operating modes</b>		
$\Delta p$ -v for variable differential pressure	X	X
$\Delta p$ -c for constant differential pressure	X	X
Fixed speed operation	X	X
Eco-Mode	-	X
<b>Manual functions</b>		
Setting the operating mode	X	X
Setting the differential pressure setpoint	X	X
Setting the speed level	X	X
Vent plug	X	-
Deblocking of rotor	X	-
<b>Automatic functions</b>		
Continuous power adjustment depending on the operating mode ( $\Delta p$ control)	X	X
Setback operation	X	X
Soft start	X	X
Integrated interfaces: 0 - 10 V DC, external start/stop, general fault (volt-free relay contact)	-	X
<b>Signalling functions and display functions</b>		
Error codes indicated on the display	X	X
"In operation" message via additional module	-	-
Alternating display of flow rate, head and electrical input power	X	X
<b>Electrical connection</b>		
Compatible 230 V jack	X	-

**Technical data**

Calio S / Calio S BMS selection table

Size	Connection		PN [bar]	P <sub>1</sub> [W]	Motor protection <sup>3)</sup>	Signalling contacts <sup>4)</sup>	I <sub>N</sub> 1~230 V AC, 50/60 Hz [A]	Mat. No.	[kg]
	Piping	Pump							
<b>Calio S</b>									
15-40-130	Rp 1/2	G 1	10	6 - 30	X	-	0,6 - 0,26	29134987	2,7
15-60-130	Rp 1/2	G 1	10	6 - 50	X	-	0,6 - 0,43	29134988	2,7
25-40-130	Rp 1	G 1 1/2	10	6 - 30	X	-	0,06 - 0,26	29134989	2,7
25-60-130	Rp 1	G 1 1/2	10	6 - 50	X	-	0,06 - 0,43	29134990	2,7
25-40	Rp 1	G 1 1/2	10	6 - 30	X	-	0,06 - 0,26	29134991	2,8
25-60	Rp 1	G 1 1/2	10	6 - 50	X	-	0,06 - 0,43	29134992	2,8
30-40	Rp 1 1/4	G 2	10	6 - 30	X	-	0,06 - 0,26	29134993	2,9
30-60	Rp 1 1/4	G 2	10	6 - 50	X	-	0,06 - 0,43	29134994	2,9
<b>Calio S BMS</b>									
25-60	Rp 1	G 1 1/2	10	8 - 100	X	X	0,10 - 0,80	29134307	4,6
30-60	Rp 1 1/4	G 2	10	8 - 100	X	X	0,10 - 0,80	29134308	4,8

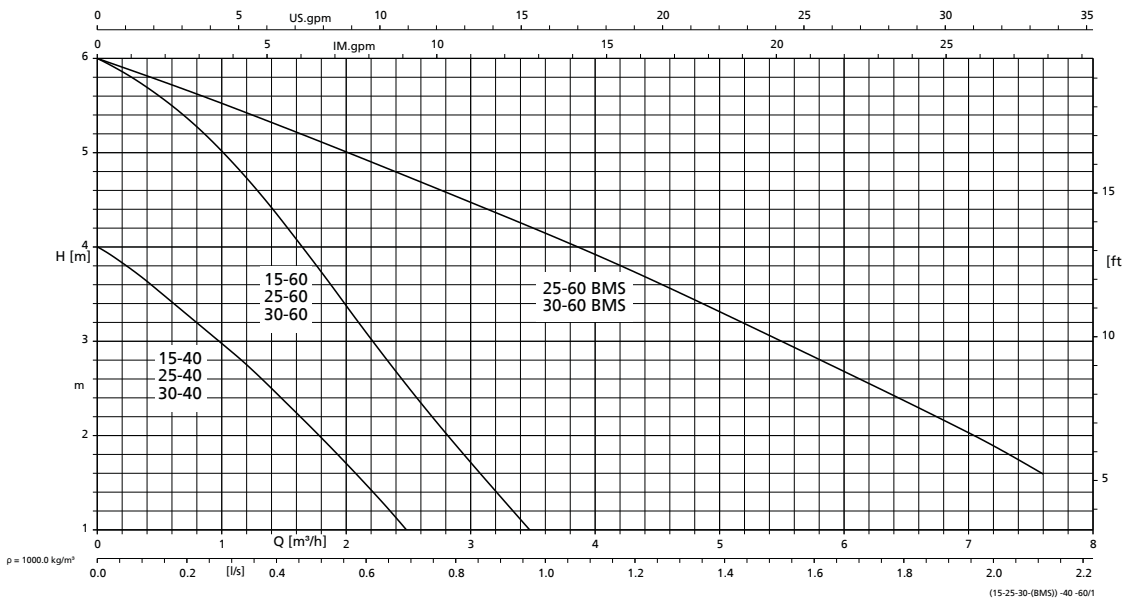
3) Integrated motor protection

4) General fault message relay and terminal pairs for 0 - 10 V input and external start/stop



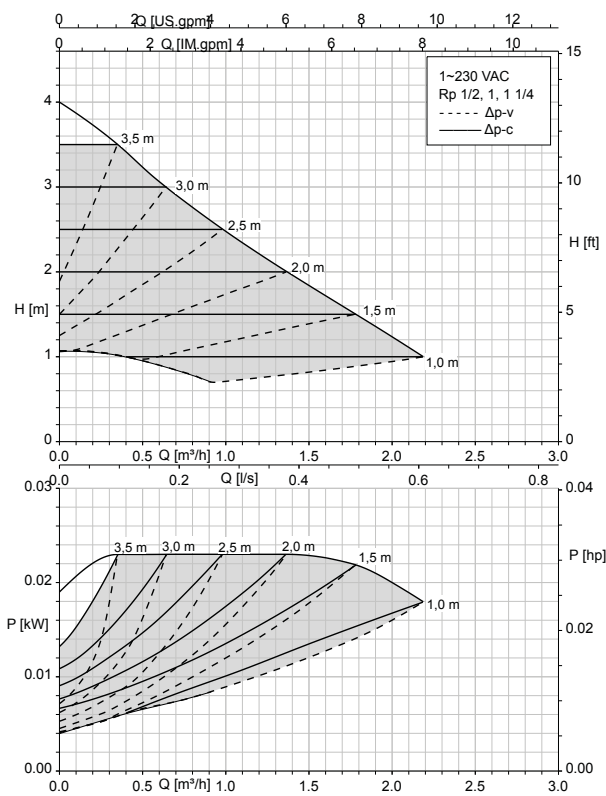
Selection chart

Calio S



Characteristic curves

Calio S 15/25/30-40  $\Delta p_v$ ,  $\Delta p_c$



Calio S 15/25/30-40 Boost Mode

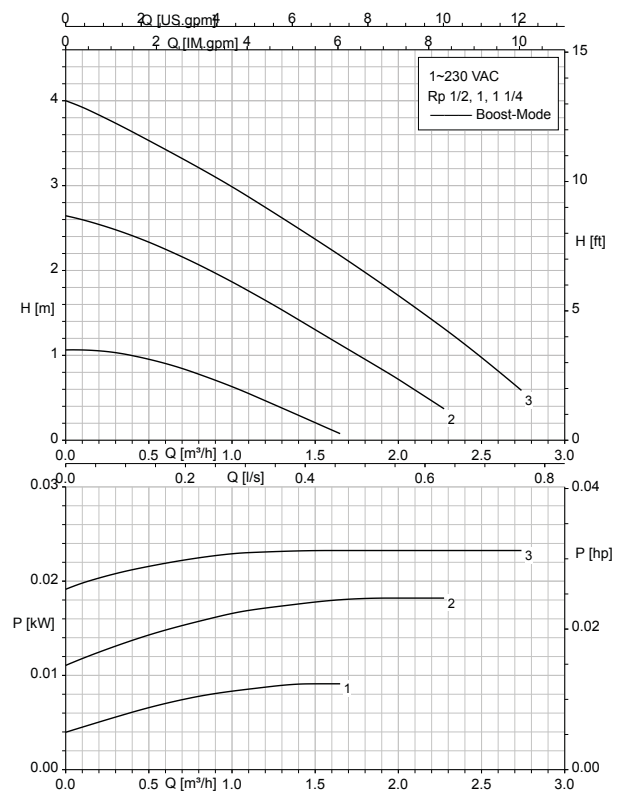
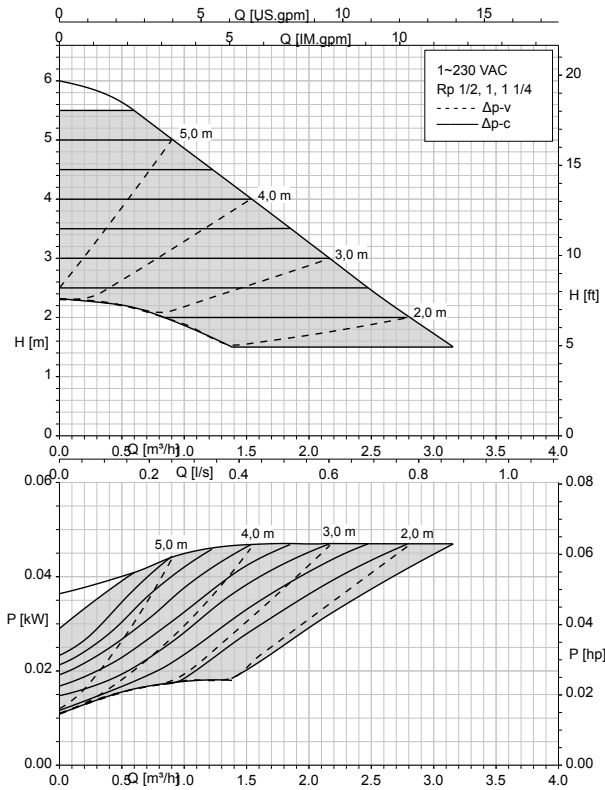
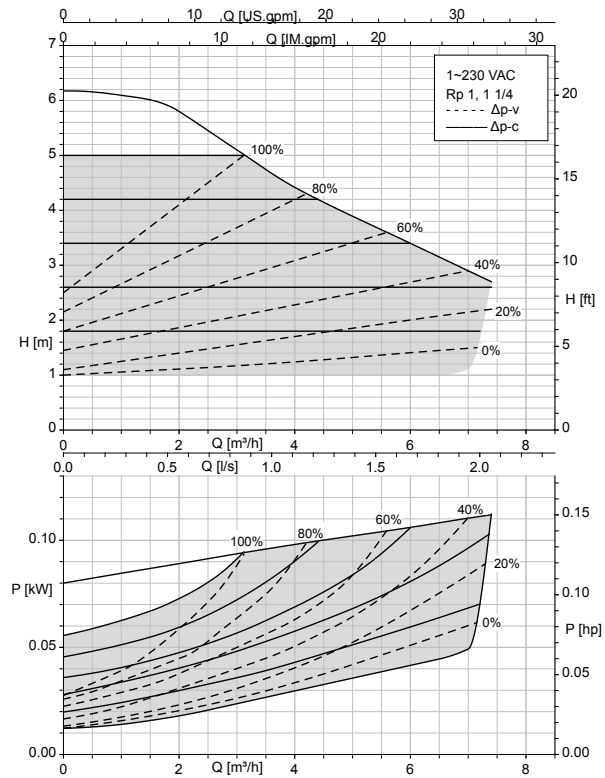


Fig. 2: 1, 2, 3 = speed level 1, 2, 3

**Calio S 15/25/30-60  $\Delta p_v$ ,  $\Delta p_c$**



**Calio S BMS 25/30-60  $\Delta p_v$ ,  $\Delta p_c$**



**Calio S 15/25/30-60 Boost Mode**

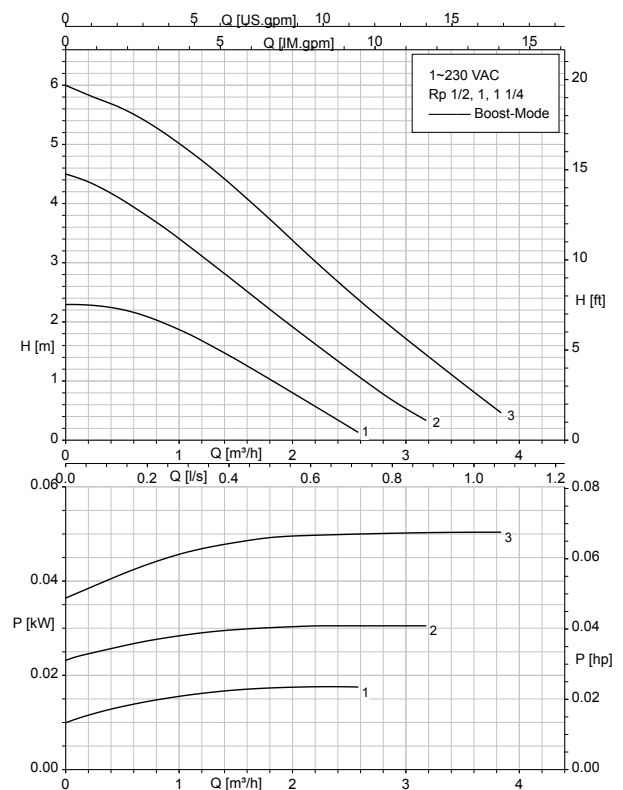
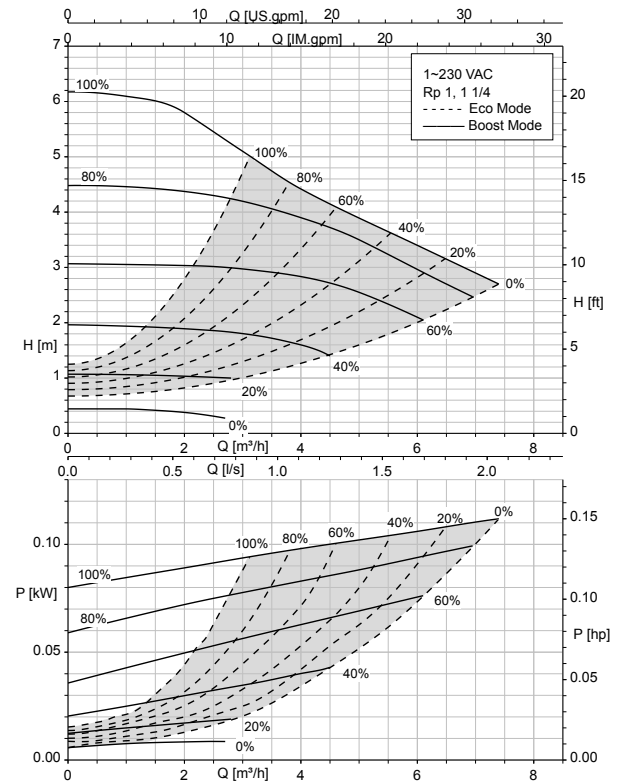


Fig. 3: 1, 2, 3 = speed level 1, 2, 3

**Calio S BMS 25/30-60 Boost Mode, Eco Mode**



Dimensions

Calio S / Calio S BMS

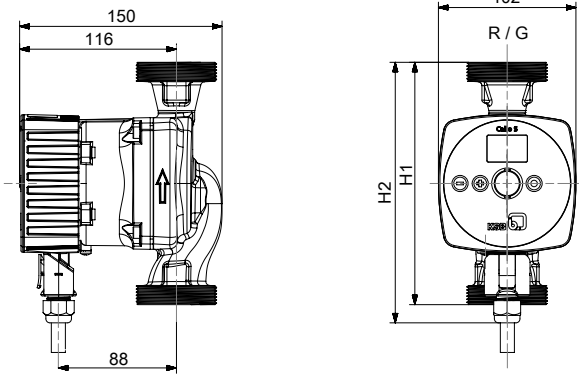


Fig. 4: Calio S dimensions [mm]

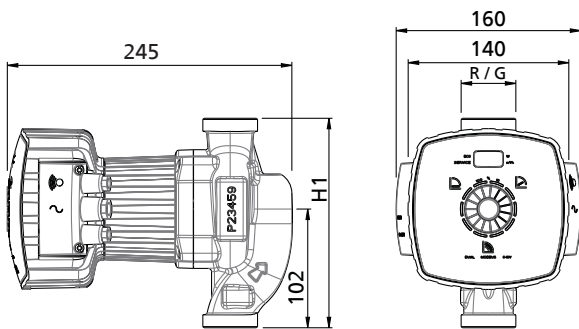


Fig. 5: Calio S BMS dimensions [mm]

Dimensions [mm]

Size	Rp	G	H1	H2
<b>Calio S</b>				
15-40-130	1/2	1	130	150
15-60-130	1/2	1	130	150
25-40-130	1	1 1/2	130	150
25-60-130	1	1 1/2	130	150
25-40	1	1 1/2	180	200
25-60	1	1 1/2	180	200
30-40	1 1/4	2	180	200
30-60	1 1/4	2	180	200
<b>Calio S BMS</b>				
25-60	1	1 1/2	180	-
30-60	1 1/4	2	180	-

Installation information

Permissible installation positions

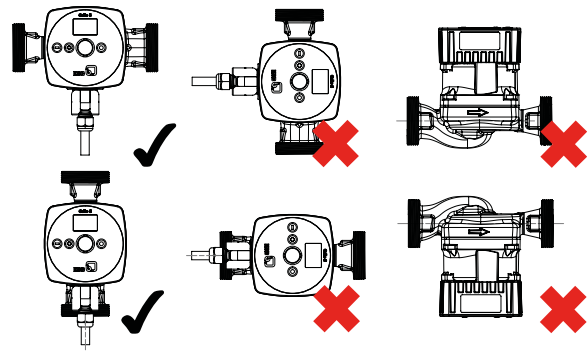


Fig. 6: Permissible installation positions

Scope of supply

- Pump
- Sealing elements
- Installation/operating manual
- Insulation shells (for overall length  $\geq 180$  mm only)



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