



Calio
PUMPS
پمپ

Type Series Booklet



High-efficiency Circulator Pump

Calio

Type Series Booklet





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Type Series Booklet Calio

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Building Services: Heating

Variable Speed Circulator Pumps

Calio



Main applications

Heating, ventilation, air-conditioning, refrigerating and circulation systems

- One-pipe and two-pipe systems
- Underfloor heating systems
- Boiler or primary circuits
- Storage tank circuits
- Solar power systems
- Heat pumps

Fluids handled

- Heating water to VDI 2035
- Highly viscous fluids (e.g. 30 % glycol content and above) on request
- Pure, thin-bodied, non-aggressive and non-explosive fluids not containing any mineral oil, solids or long fibres
- Fluids with a viscosity of 10 mm²/s max.

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	Screw-ended pumps: ≤ 15
		Flanged pumps: ≤ 32
	Q [l/s]	Screw-ended pumps: ≤ 4.2
		Flanged pumps: ≤ 8.9
Head	H [m]	Screw-ended pumps: ≤ 12
		Flanged pumps: ≤ 18
Fluid temperature	T [°C]	-10 to +110

Characteristic		Value
Ambient temperature	T [°C]	0 to 40
Operating pressure	p [bar]	≤ 16
Pressure class	PN [bar]	6/10/16
Sound pressure level	[dB (A)]	< 45
Connection	Screwed connection: R 1, R 1 1/4	
	Flange: DN 32, DN 40, DN 50, DN 65	

Designation

Example: Calio 25-100

Key to the designation

Code	Description
Calio	High-efficiency pump
25	Nominal diameter of pipe connection
	25 = R 1
	30 = R 1 1/4
	32 ... 65 = DN 32 ... DN 65
100	Head in m x 10 (example 100 = 10 m)

Design details

Design

- Highly efficient, maintenance-free wet rotor pump (glandless)
- Screw-ended or flanged
- High-efficiency electric motor with continuously variable differential pressure control

Operating modes

- Constant-pressure and proportional-pressure control
- Eco Mode with dynamic differential pressure setpoint adjustment
- Fixed-speed operation with manual setpoint input

Automatic functions

- Continuous output adjustment depending on the mode of operation
- 0 – 10 V with external differential pressure setpoint/speed setting
- Dual pump configuration
- Modbus
- Setback operation
- External start/stop
- Deblocking function
- Self-venting function
- Soft start
- Full motor protection with integrated trip electronics
- General fault message
- "System operational" message via additional module (Calio 25, 30, 32, 40-60/-70/-80/-90/-100, 50-40/-60/-80/-90, 65-60)
- Integrated "system operational" message (Calio 40-120/-180, 50-100/-120/-150/-180)

Manual functions

- Setting the operating mode
- Setting the differential pressure setpoint

- Setting the speed level

Signalling and display functions

- Alternating display of flow rate and electrical input power
- Error codes indicated on the display

Drive

- Electronically commutated synchronous motor with permanent magnet rotor
- 1~230 VAC, 50/60 Hz
- IP44 enclosure
- Thermal class F
- Temperature class TF 110
- RFI emission EN 61 000-6-3
- Interference immunity EN 61 000-6-2

Bearings

- Product-lubricated special plain bearing

Materials

Overview of available materials

Component	Material
Volute casing	Grey cast iron with cathodic electrocoating (EN-GJL-200)
Shaft	Stainless steel 1.4034
Impeller	Plastic with 30 % glass fibre content
Bearings	Ceramics/carbon (metal-impregnated)
Can	Stainless steel 1.4301
Thermal insulation	Polypropylene

Product benefits

- Maximum savings of operating costs by high-efficiency technology combined with speed control
- Future-proof by maximum energy efficiency, exceeding future energy efficiency regulations such as ErP2015
- All-in concept saves investment and commissioning costs. (⇒ Page 8)
- Simple to set with press&turn dial combined with an integrated display and symbols indicating the operating mode
- High availability by dual pump operation and integrated protective functions
- New Eco Mode enables additional savings of more than 40 % compared with Proportional-pressure Control. (⇒ Page 7)

Certifications

Overview

Label	Valid in:	Comment
	Europe	EEL ≤ 0.23
	Germany	All pump sizes

Selection information

Minimum pressure

The minimum pressure $p_{\min}$ at the pump suction nozzle serves to avoid cavitation noises at an ambient temperature of $+40^{\circ}\text{C}$ 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.

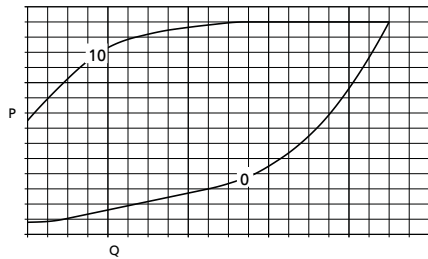
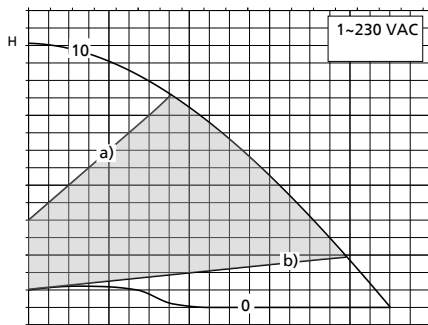
Minimum pressure $p_{\min}$ [bar] specified for the fluid temperature $^{\circ}\text{C}$

Size	Fluid temperature	Minimum pressure
	$^{\circ}\text{C}$	[bar]
All	Up to 80	0,5
	81 to 95	1,5

Fluid temperature $^{\circ}\text{C}$ specified for the ambient temperature $^{\circ}\text{C}$

Size	Fluid temperature	Ambient temperature
	$^{\circ}\text{C}$	$^{\circ}\text{C}$
All	110	30
	90	40

Description of the characteristic curve

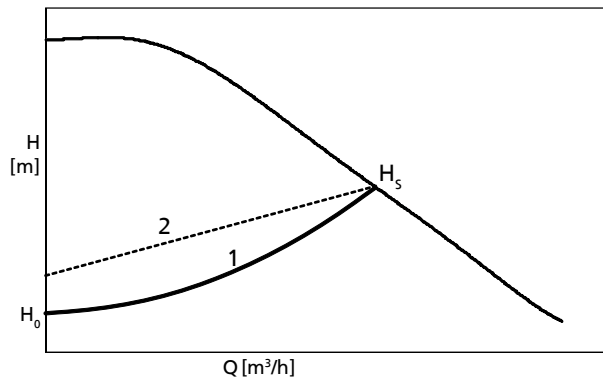


Selection example

0	Level 0	Open-loop control, min. speed
10	Level 10	Open-loop control, max. speed
	Control range	
a)	Characteristic curve, maximum head	
b)	Characteristic curve, minimum head	
 The characteristic curve can be adjusted between a) and b) by turning the control dial.		

Description of the Eco Mode

In Eco Mode, the pump characteristic curve (1) is quadratic. Starting at the discharge head setpoint H_s , the characteristic curve intersects the discharge head axis at $H_0 = 1/4 \times H_s$. By changing the differential pressure setpoint this pump characteristic curve can be adjusted to higher or lower differential pressures or discharge heads. Compared with the Proportional-pressure Control operating mode the Eco Mode can save more than 40 % in electrical input power. See below for an example of an Eco Mode characteristic curve.



1	Eco Mode characteristic curve
2	Proportional-pressure Control characteristic curve for comparison

Description of the Modbus interface

Description see Calio operating manual.

Planning information for flanges

Flanged pumps fitted with an adapter (slotted bolt hole) flange can be connected to PN 6 and PN 16 mating flanges to DIN or DIN EN up to and including nominal diameters of DN 65. Adapter flanges of this type cannot be mated with other adapter flanges. Use bolts of property class 4.6 or higher for the flange connections. Washers must be fitted between the bolt/nut head and the adapter flange.

Recommended bolt lengths [mm]

Thread	Tightening torque	Min. bolt length
		DN 40/50
PN 6 flanged connection		
M12	40 Nm	55
PN 10 flanged connection		
M16	95 Nm	60

Programme overview / selection tables

Features and functions

Features and functions

Functions	Included
Operating modes	
Δp -v for variable differential pressure	X
Δp -c for constant differential pressure	X
Eco Mode with dynamic differential pressure setpoint adjustment	X
Open-loop control	X
Manual functions	
Setting of operating mode	X
Setting of differential pressure setpoint	X
Setting of speed level	X
Automatic functions	
Continuous output adjustment depending on the mode of operation (Δp control)	X
Setback operation	X
Deblocking function (start-up at max. torque)	X
Soft start	X
Interfaces of all-in concept	
Integrated 0 - 10 V interface for differential pressure/speed setpoint	X
Serial digital Modbus RTU interface for connection to a building management system via RS485 bus system	X
Dual pump management with duty/stand-by operation with two single pumps (automatic changeover in the event of a fault as well as timer-controlled changeover)	X
Integrated start/stop interface (terminal pair RUN)	X
Integrated general fault message relay (volt-free changeover contact)	X
Signalling and display functions	
"System operational" message via additional module	X
Integrated volt-free "system operational" message relay (Calio 40-120/180, Calio 50-100/120/150/180)	X
Alternating display of flow rate and electrical input power	X
Operating mode displayed by symbols	X
Error codes indicated on the display	X

Technical data

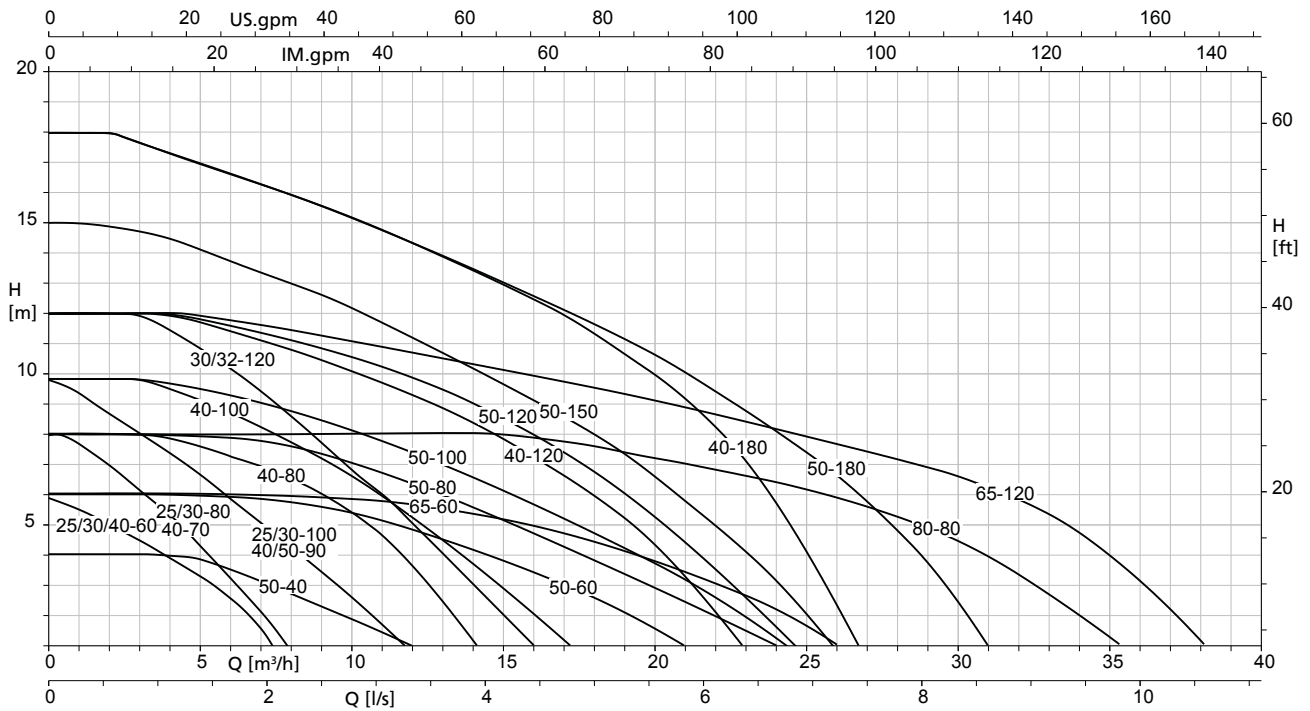
Calio selection table

Calio	R DN	G	PN	P ₁	Motor protection	Signalling contacts	Nominal current	Mat. No.	[kg]
				[W]			1~230 VAC, 50/60 Hz [A]		
25-60	R 1	G 1 ½	10	8 - 100	X	1, 3	0,10 - 0,80	29134276	4.6
25-60	R 1	G 1 ½	16	8 - 100	X	1, 3	0,10 - 0,80	29134478	4.7
25-80	R 1	G 1 ½	10	8 - 140	X	1, 3	0,10 - 1,15	29134277	4.6
25-80	R 1	G 1 ½	16	8 - 140	X	1, 3	0,10 - 1,15	29134479	4.7
25-100	R 1	G 1 ½	10	8 - 175	X	1, 3	0,10 - 1,40	29134278	4.6
25-100	R 1	G 1 ½	16	8 - 175	X	1, 3	0,10 - 1,40	29134480	4.7
30-60	R 1 ¼	G 2	10	8 - 100	X	1, 3	0,10 - 0,80	29134279	4.8
30-60	R 1 ¼	G 2	16	8 - 100	X	1, 3	0,10 - 0,80	29134481	4.9
30-80	R 1 ¼	G 2	10	8 - 140	X	1, 3	0,10 - 1,15	29134280	4.8
30-80	R 1 ¼	G 2	16	8 - 140	X	1, 3	0,10 - 1,15	29134482	4.9
30-100	R 1 ¼	G 2	10	8 - 175	X	1, 3	0,10 - 1,40	29134281	4.8
30-100	R 1 ¼	G 2	16	8 - 175	X	1, 3	0,10 - 1,40	29134483	4.9
30-120	R 1 ¼	G 2	10	15 - 350	X	1, 3	0,20 - 1,80	29134282	6.4
30-120	R 1 ¼	G 2	16	15 - 350	X	1, 3	0,20 - 1,80	29134484	6.5
32-120	DN 32	-	6/10	15 - 350	X	1, 3	0,20 - 1,80	29134283	9.3
32-120	DN 32	-	16	15 - 350	X	1, 3	0,20 - 1,80	29134485	9.4
40-60	DN 40	-	6/10	8 - 100	X	1, 3	0,10 - 0,90	29134284	8
40-60	DN 40	-	16	8 - 100	X	1, 3	0,10 - 0,90	29134486	8.2
40-70	DN 40	-	6/10	8 - 140	X	1, 3	0,10 - 1,20	29134309	8
40-70	DN 40	-	16	8 - 140	X	1, 3	0,10 - 1,20	29134329	8.2
40-80	DN 40	-	6/10	15 - 280	X	1, 3	0,20 - 1,90	29134310	11.1
40-80	DN 40	-	16	15 - 280	X	2, 3	0,20 - 1,90	29134330	11.2
40-90	DN 40	-	6/10	8 - 175	X	1, 3	0,10 - 1,40	29134311	8
40-90	DN 40	-	16	8 - 175	X	1, 3	0,10 - 1,40	29134331	8.2
40-100	DN 40	-	6/10	15 - 350	X	1, 3	0,20 - 2,20	29134312	11.1
40-100	DN 40	-	16	15 - 350	X	1, 3	0,20 - 2,20	29134332	11.2
40-120	DN 40	-	6/10	20 - 480	X	2, 3	0,10 - 2,10	29134313	18.2
40-120	DN 40	-	16	20 - 480	X	2, 3	0,10 - 2,10	29134333	18.2
40-180	DN 40	-	6/10	20 - 800	X	2, 3	0,10 - 3,50	29134314	18.2
40-180	DN 40	-	16	20 - 800	X	2, 3	0,10 - 3,50	29134334	18.2
50-40	DN 50	-	6/10	8 - 140	X	1, 3	0,10 - 1,40	29134289	9
50-40	DN 50	-	16	8 - 140	X	1, 3	0,10 - 1,40	29134491	9.2
50-60	DN 50	-	6/10	15 - 280	X	1, 3	0,20 - 1,90	29134316	12.6
50-60	DN 50	-	16	15 - 280	X	1, 3	0,20 - 1,90	29134336	12.7
50-80	DN 50	-	6/10	15 - 350	X	1, 3	0,20 - 2,20	29134317	12.6
50-80	DN 50	-	16	15 - 350	X	1, 3	0,20 - 2,20	29134337	12.7
50-90	DN 50	-	6/10	8 - 175	X	1, 3	0,10 - 1,40	29134318	9
50-90	DN 50	-	16	8 - 175	X	1, 3	0,10 - 1,40	29134338	9.2
50-100	DN 50	-	6/10	20 - 500	X	2, 3	0,10 - 2,20	29134714	21.6
50-100	DN 50	-	16	20 - 500	X	2, 3	0,10 - 2,20	29134715	21.6
50-120	DN 50	-	6/10	20 - 520	X	2, 3	0,10 - 2,30	29134346	21.6
50-120	DN 50	-	16	20 - 520	X	2, 3	0,10 - 2,30	29134347	21.6
50-150	DN 50	-	6/10	20 - 650	X	2, 3	0,10 - 2,80	29134319	21.6
50-150	DN 50	-	16	20 - 650	X	2, 3	0,10 - 2,80	29134339	21.6
50-180	DN 50	-	6/10	20 - 800	X	2, 3	0,10 - 3,50	29134320	21.6
50-180	DN 50	-	16	20 - 800	X	2, 3	0,10 - 3,50	29134340	21.6
65-60	DN 65	-	6/10	15 - 350	X	1, 3	0,20 - 2,20	29134294	16.6
65-60	DN 65	-	16	15 - 350	X	1, 3	0,20 - 2,20	29134496	16.7

X = integrated motor protection in the terminal box
 1 = "system operational" message by optional "system operational" signalling module (Mat. No. 01550860)
 2 = integrated "system operational" message
 3 = integrated general fault message

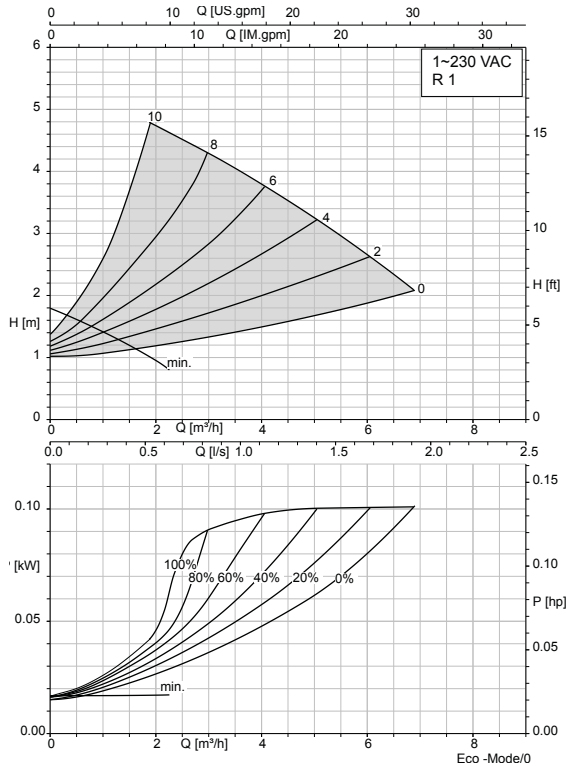
Selection chart

Calio

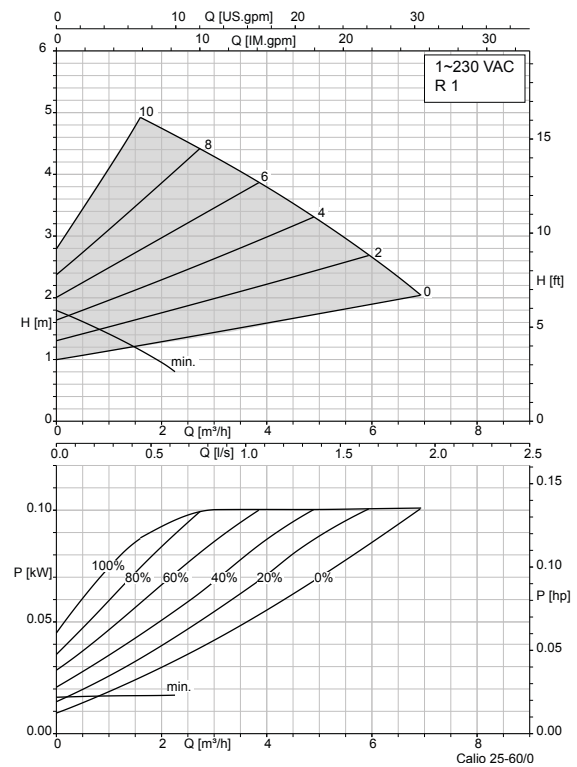


Characteristic curves

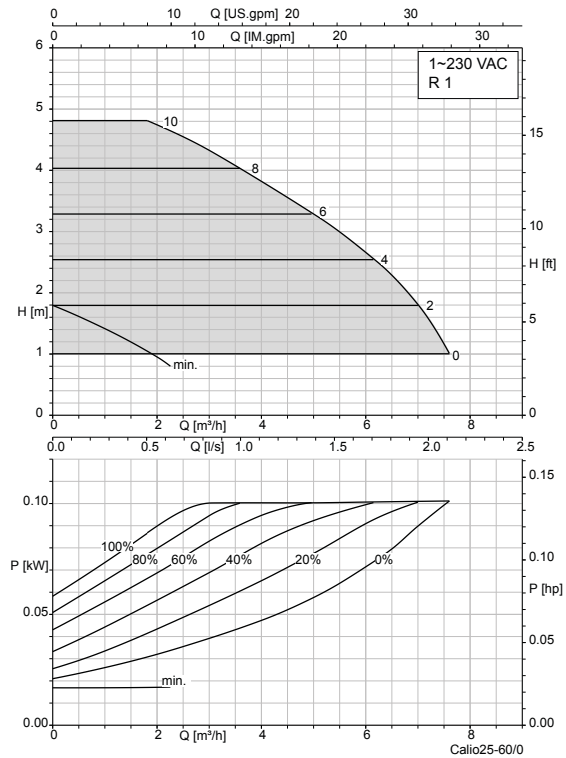
Calio 25-60, EcoMode



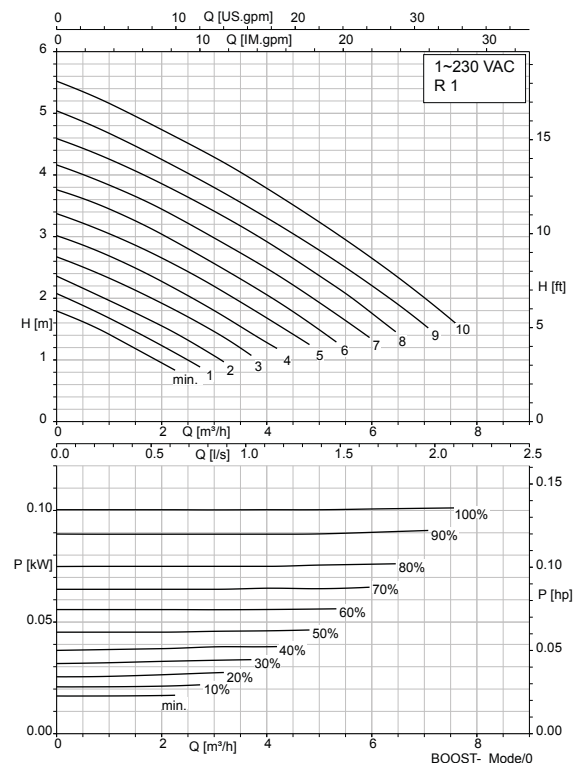
Calio 25-60, Δp_v



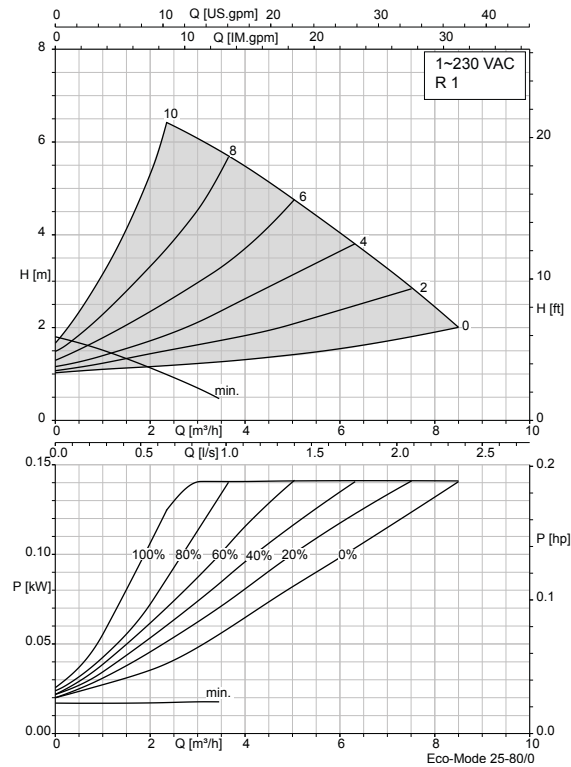
Calio 25-60, Δp_c



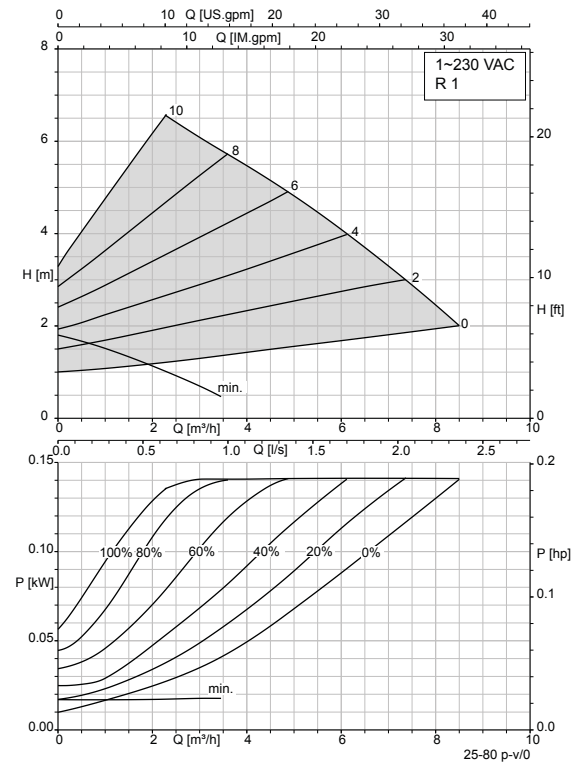
Calio 25-60, Boost



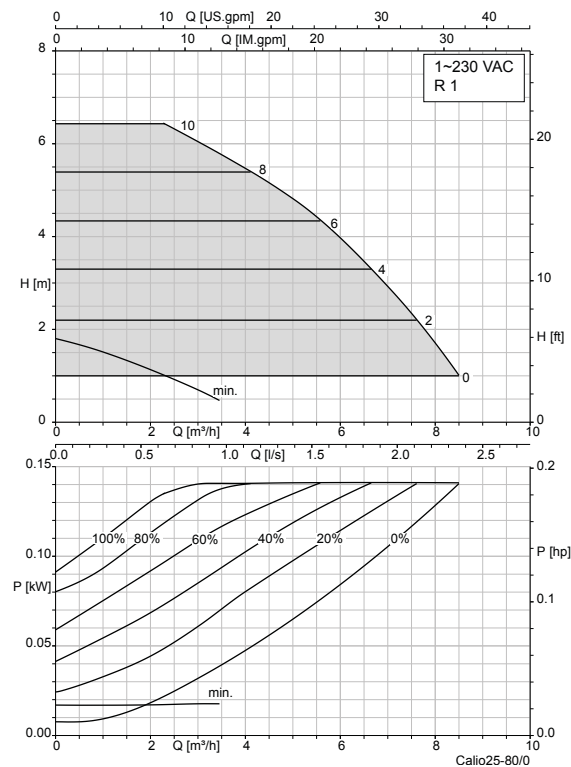
Calio 25-80, EcoMode



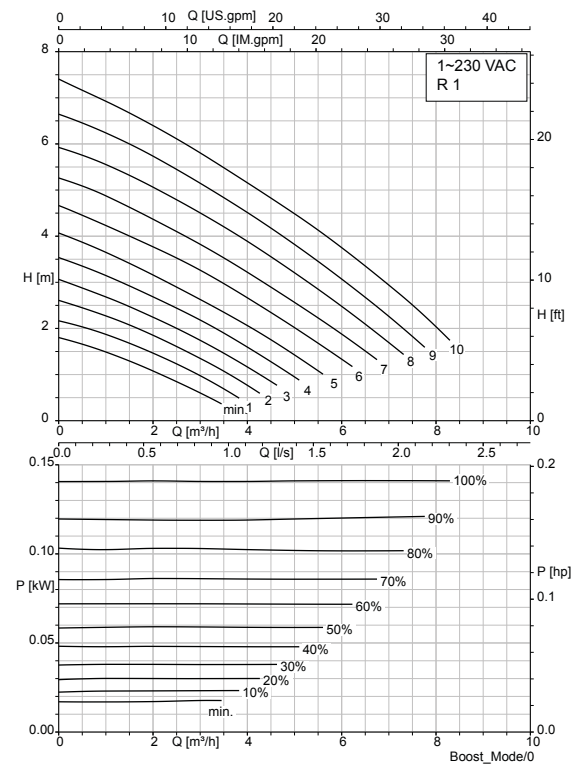
Calio 25-80, Δpv



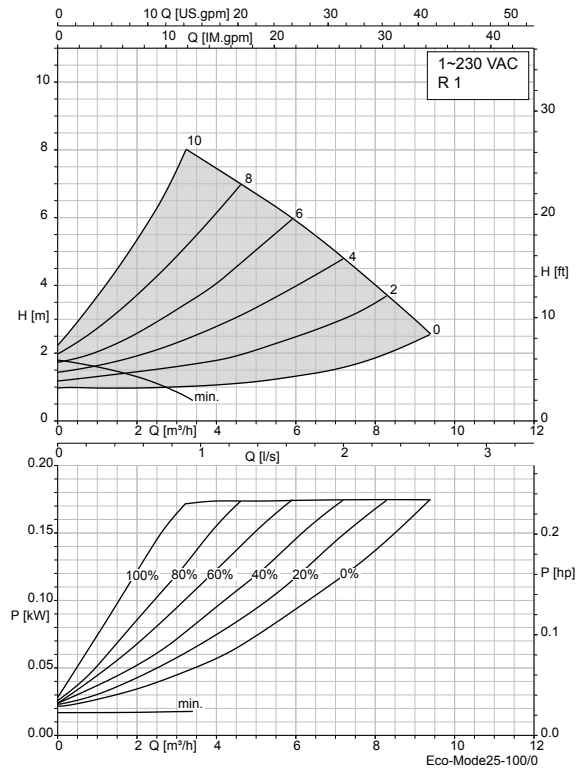
Calio 25-80, Δpc



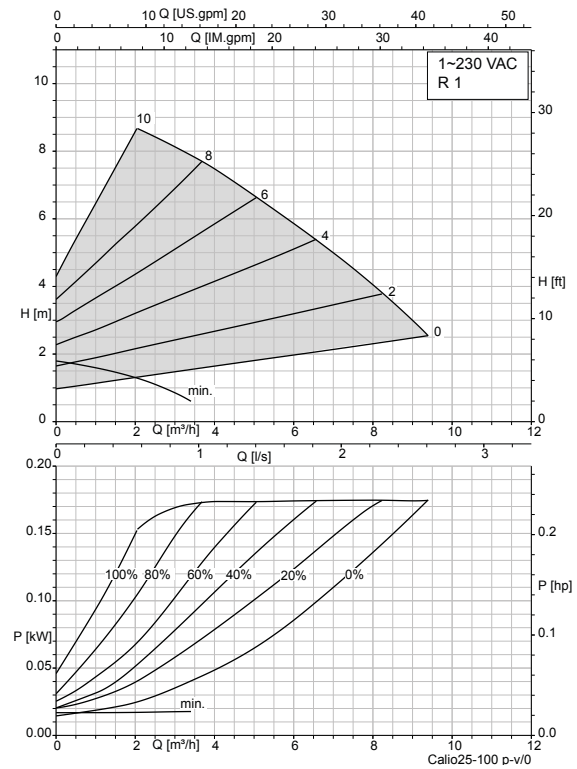
Calio 25-80, Boost



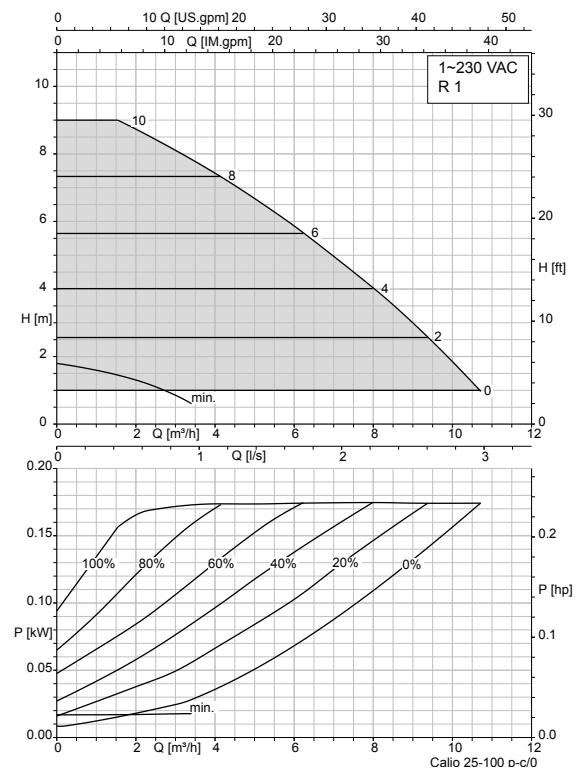
Calio 25-100, EcoMode



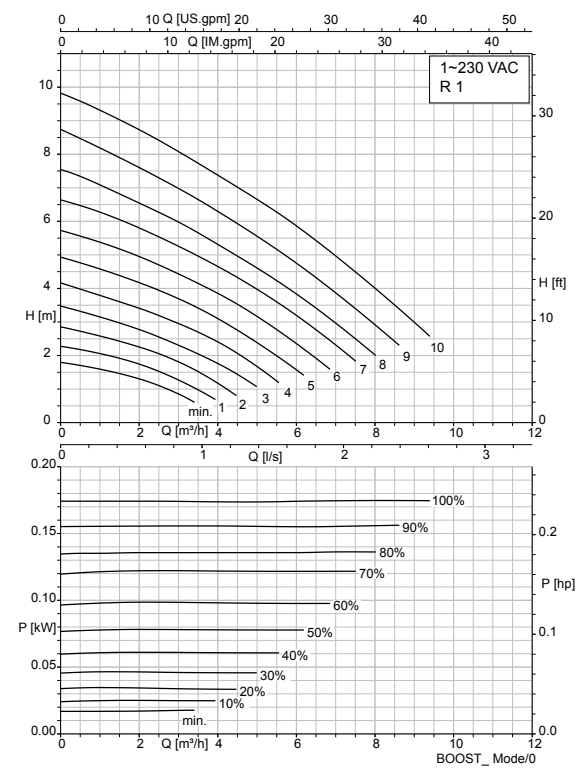
Calio 25-100, Δpv



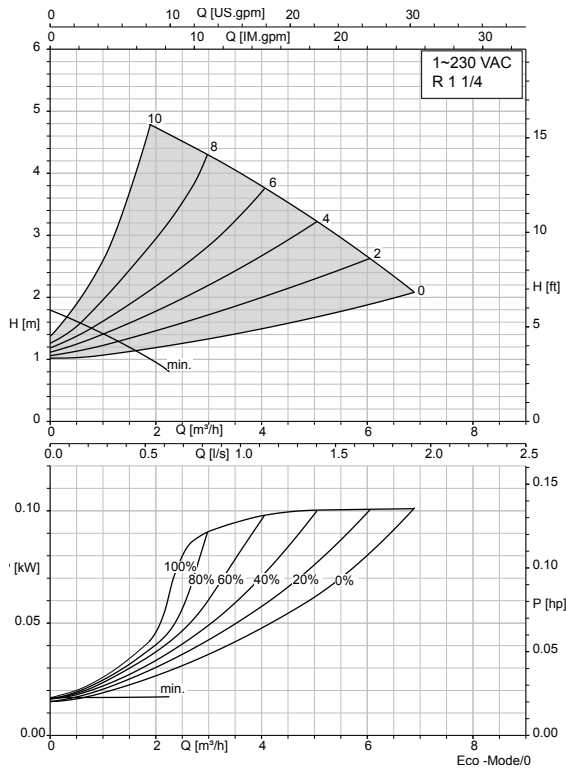
Calio 25-100, Δpc



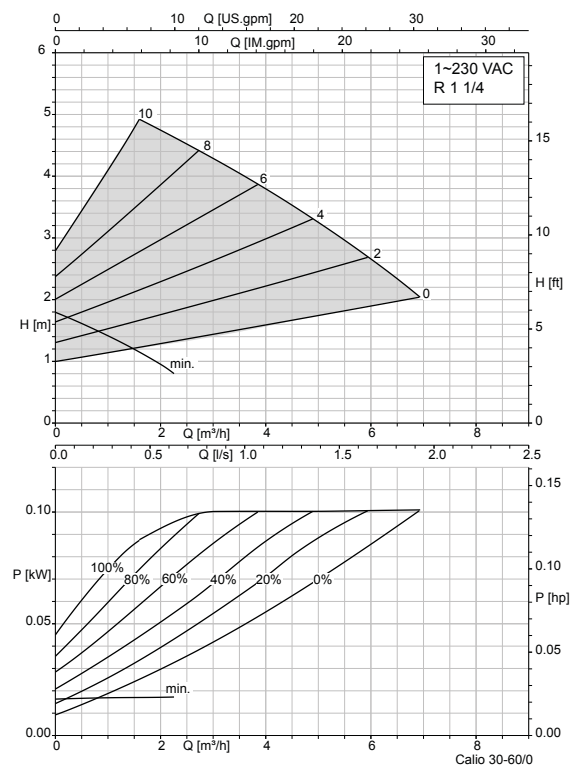
Calio 25-100, Boost



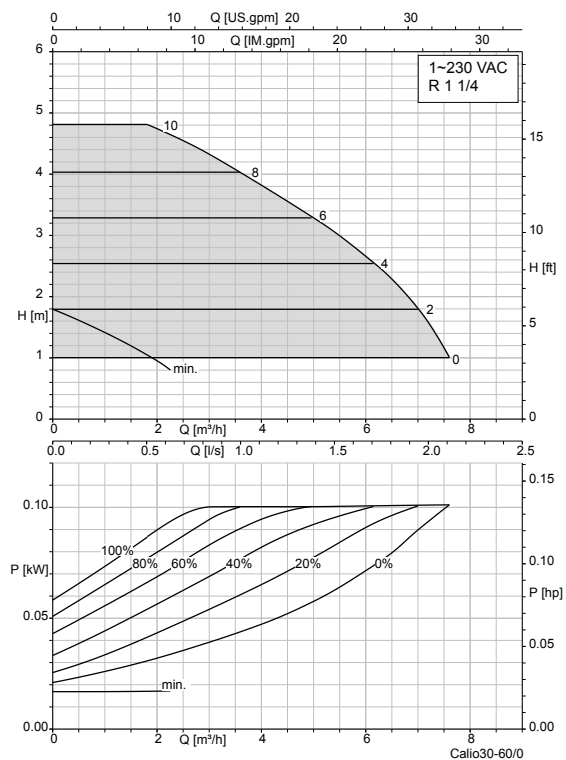
Calio 30-60, EcoMode



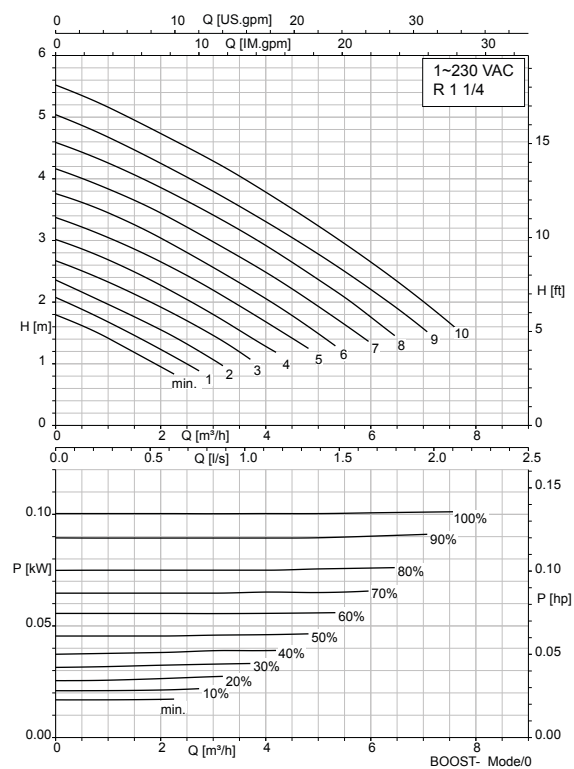
Calio 30-60, Δpv



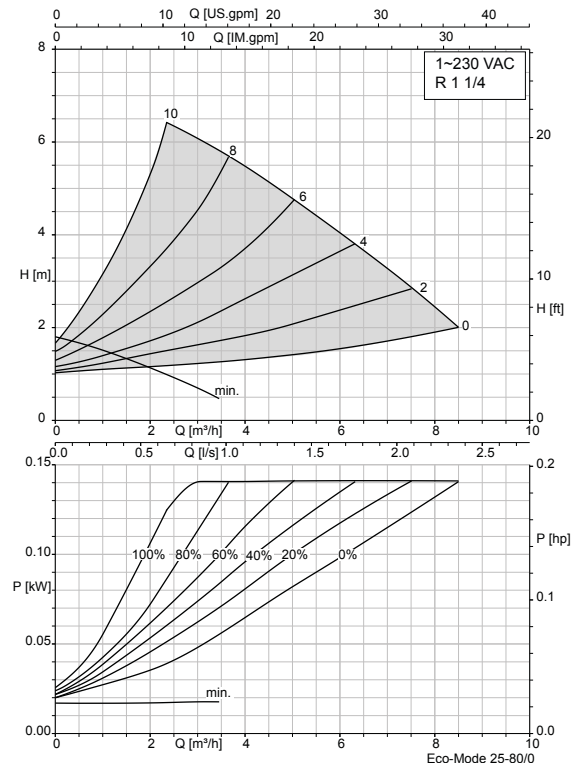
Calio 30-60, Δpc



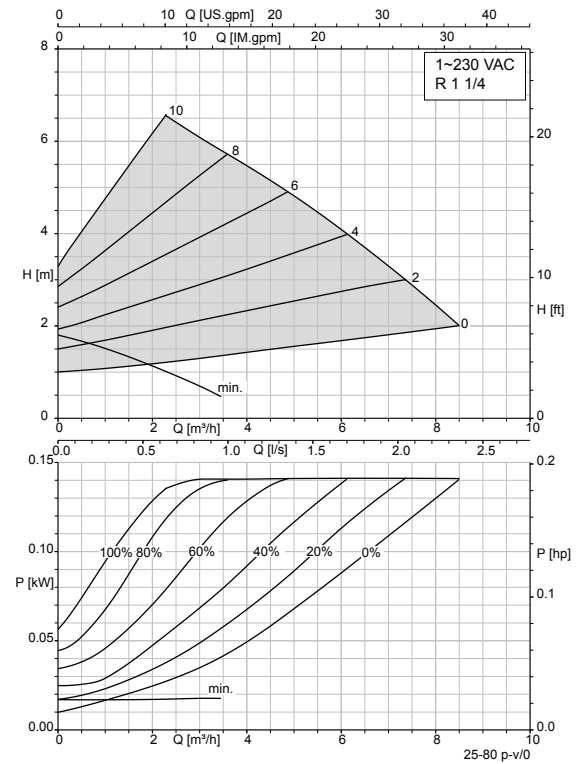
Calio 30-60, Boost



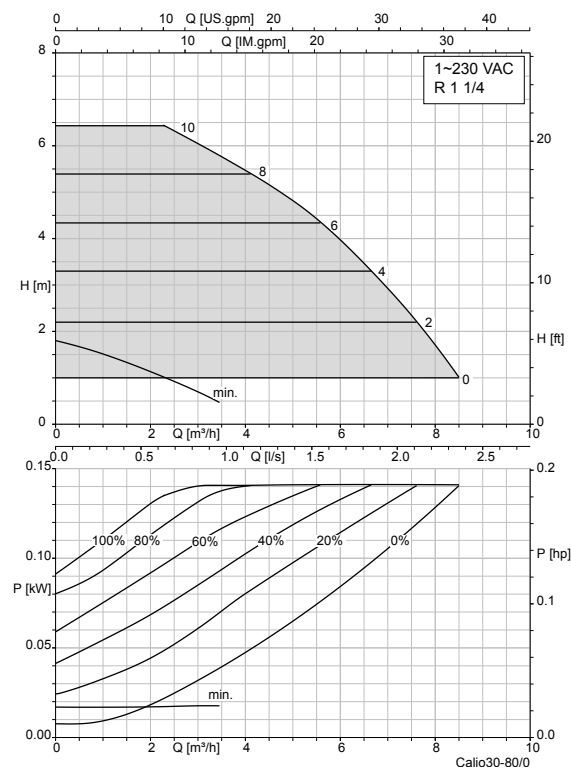
Calio 30-80, EcoMode



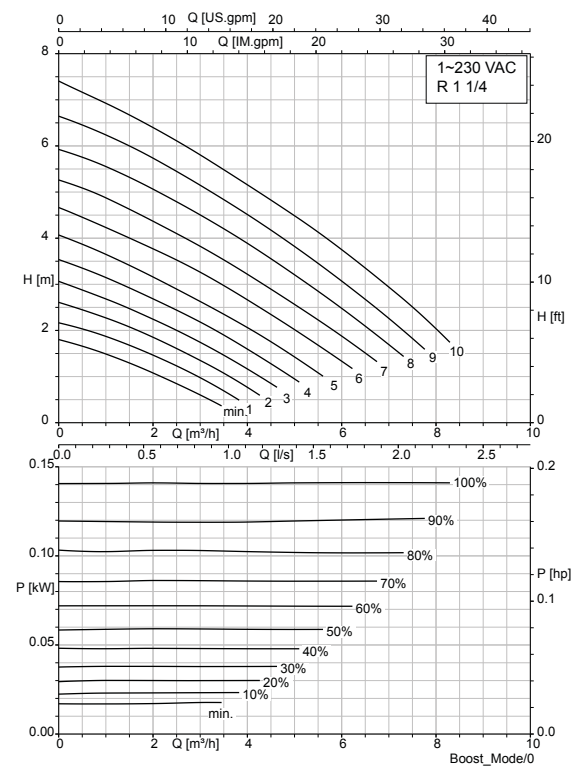
Calio 30-80, Δpv



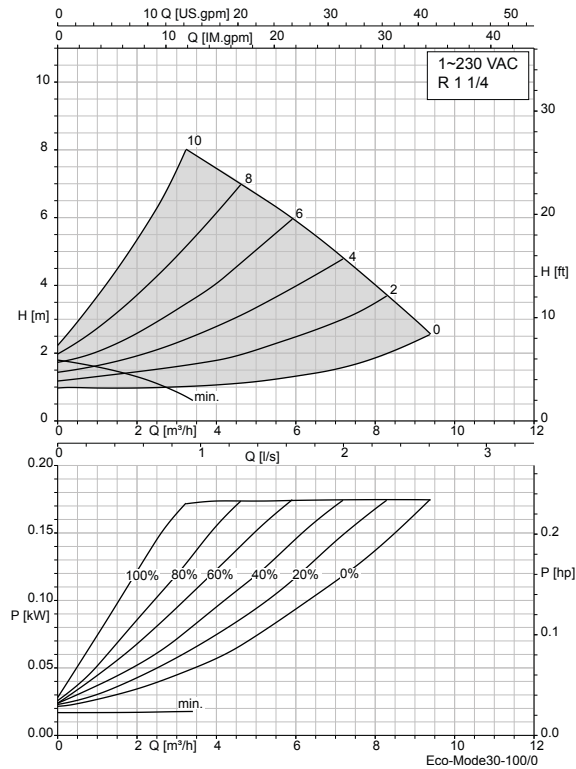
Calio 30-80, Δpc



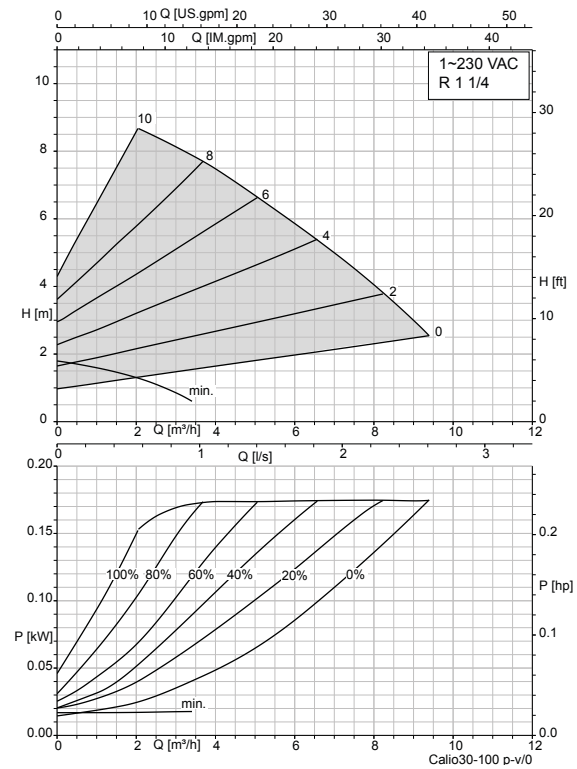
Calio 30-80, Boost



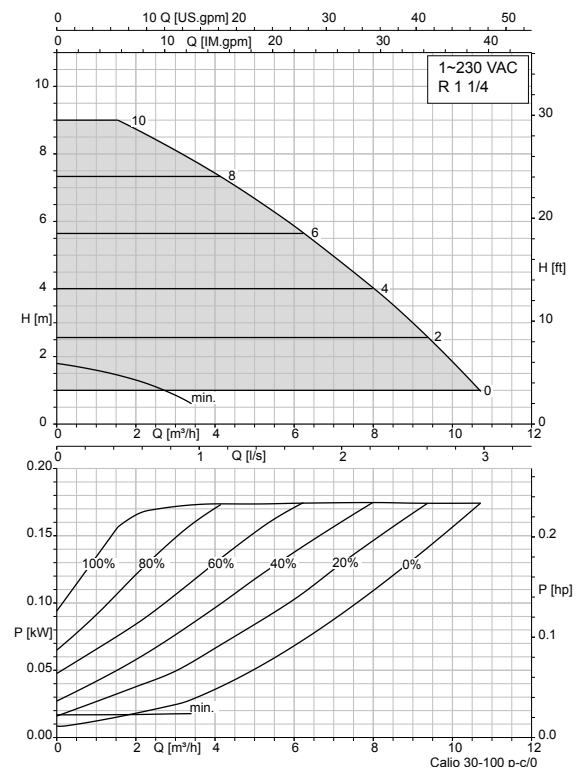
Calio 30-100, EcoMode



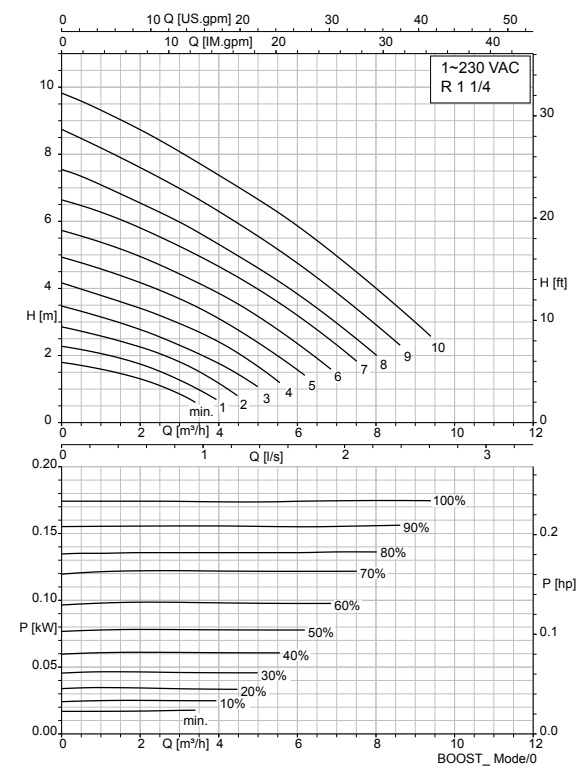
Calio 30-100, Δpv



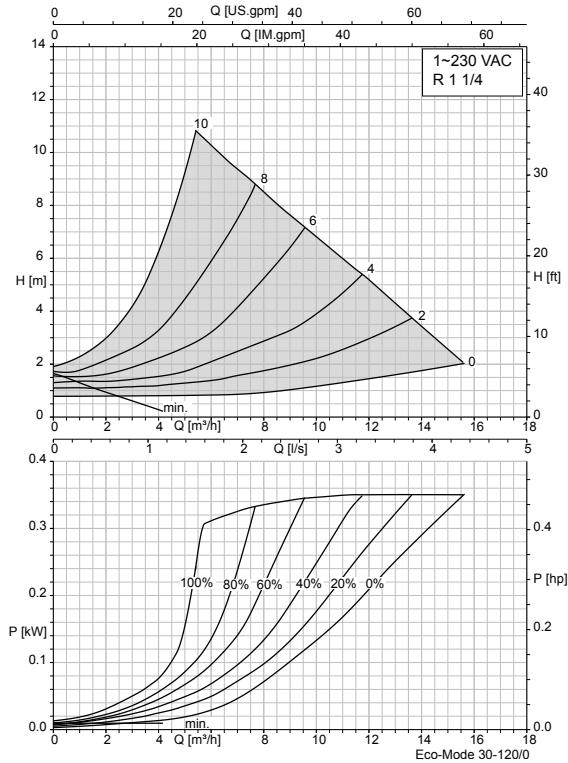
Calio 30-100, Δpc



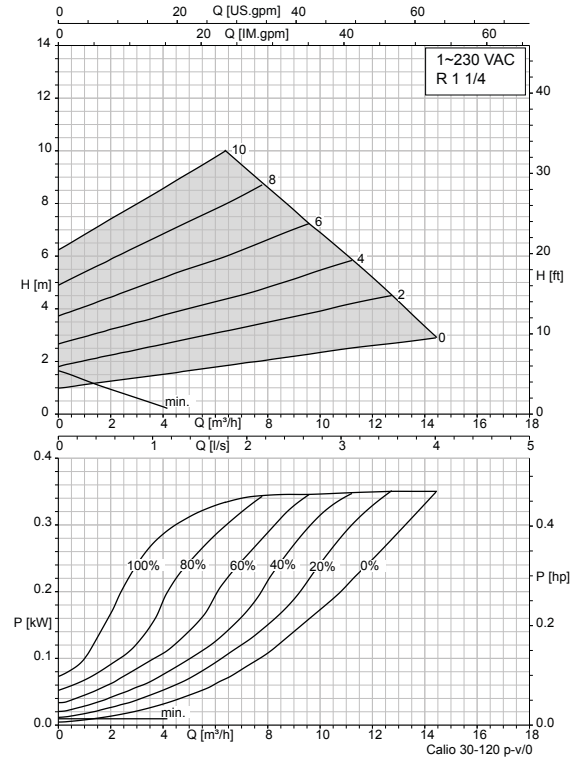
Calio 30-100, Boost



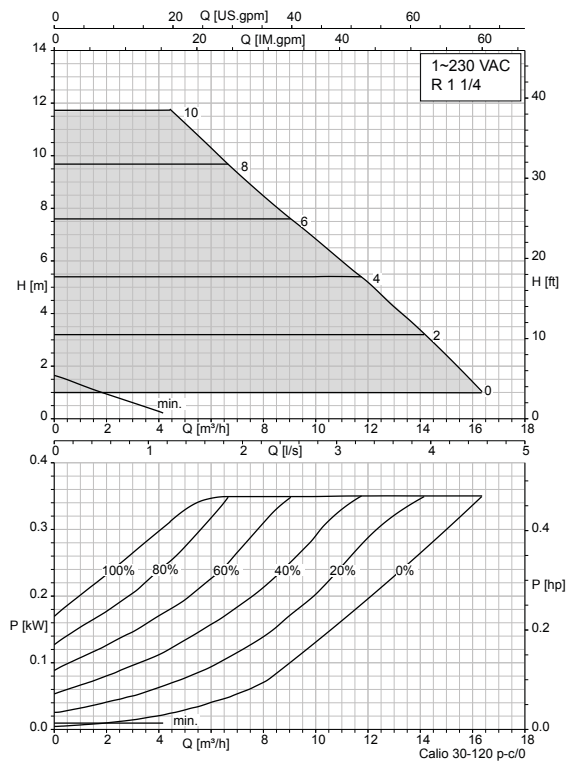
Calio 30-120, Eco Mode



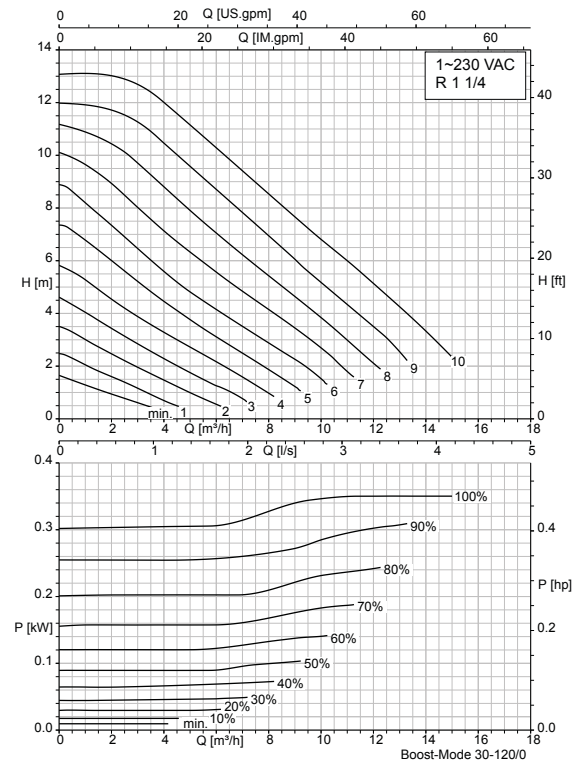
Calio 30-120, Δpv



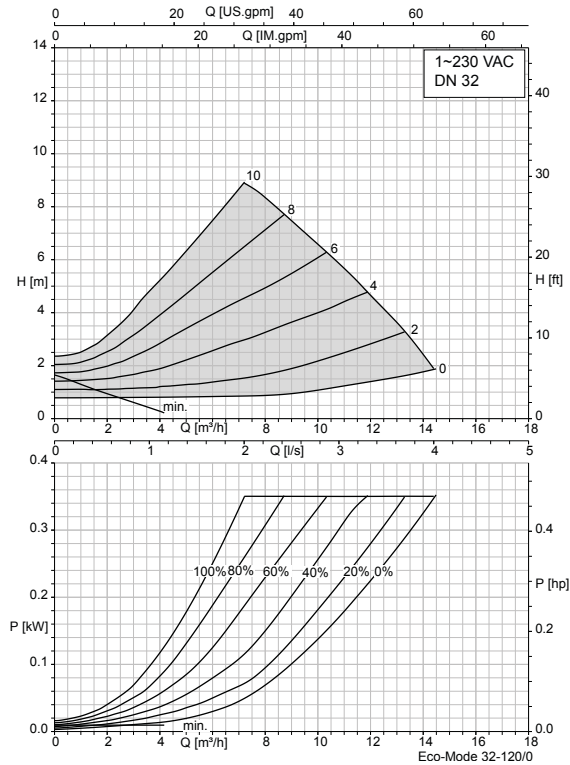
Calio 30-120, Δpc



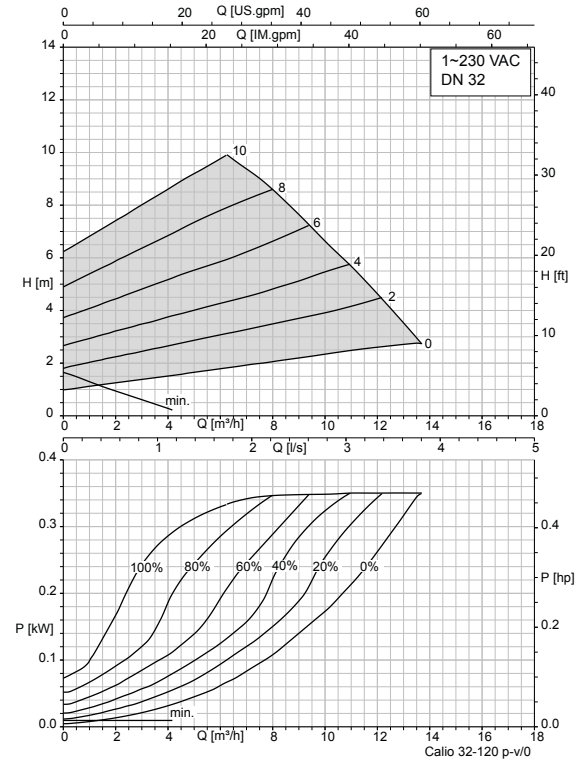
Calio 30-120, Boost



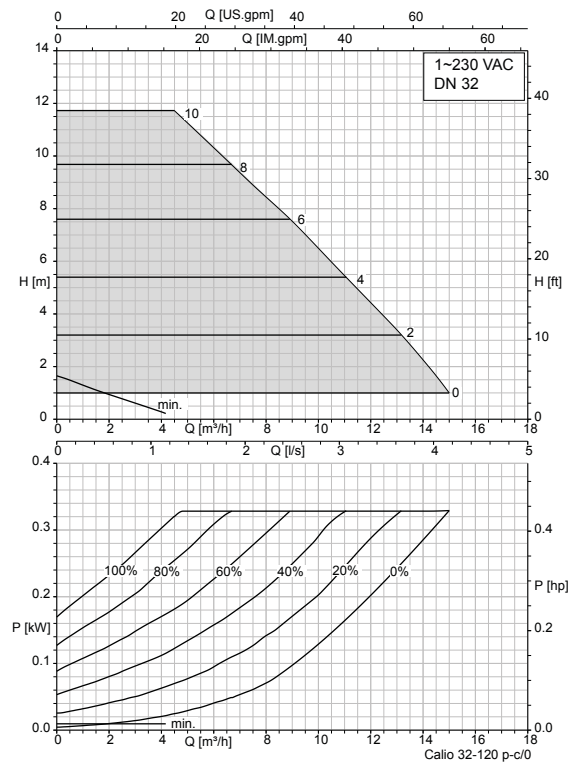
Calio 32-120, Eco Mode



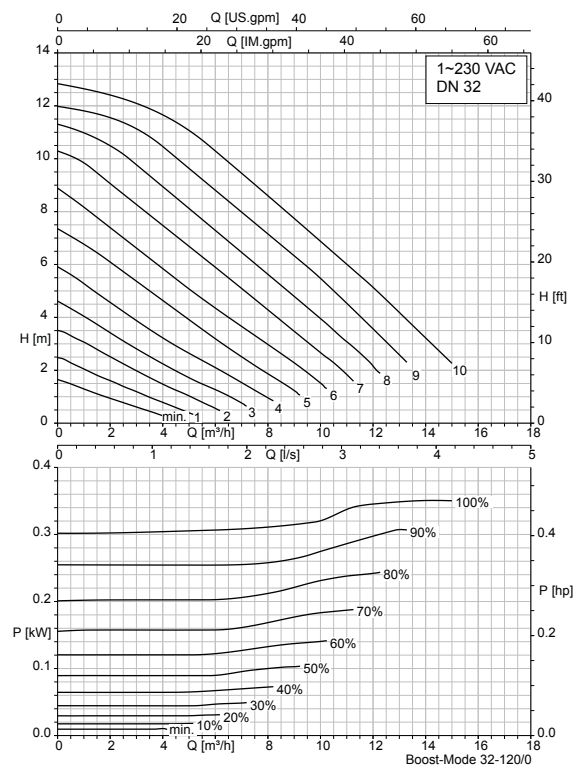
Calio 32-120, Δpv



Calio 32-120, Δpc



Calio 32-120, Boost

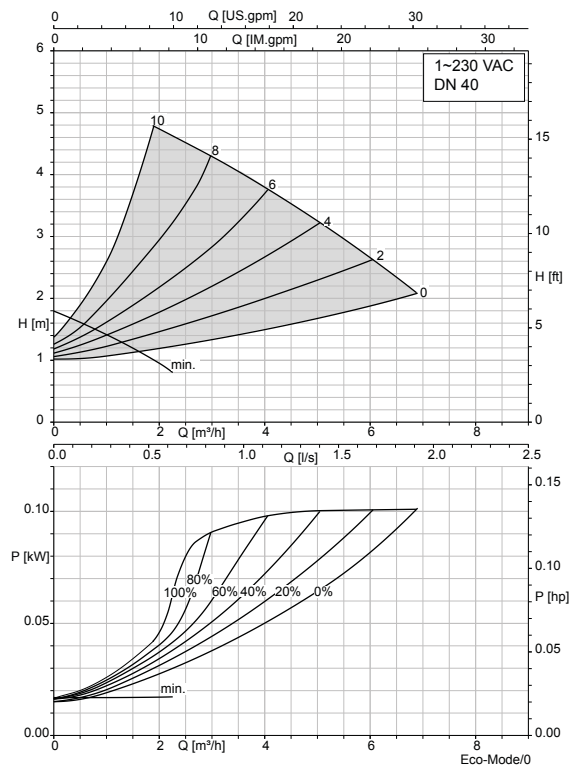


تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)، روبروی پالایشگاه نفت پارس، پلاک ۱۲

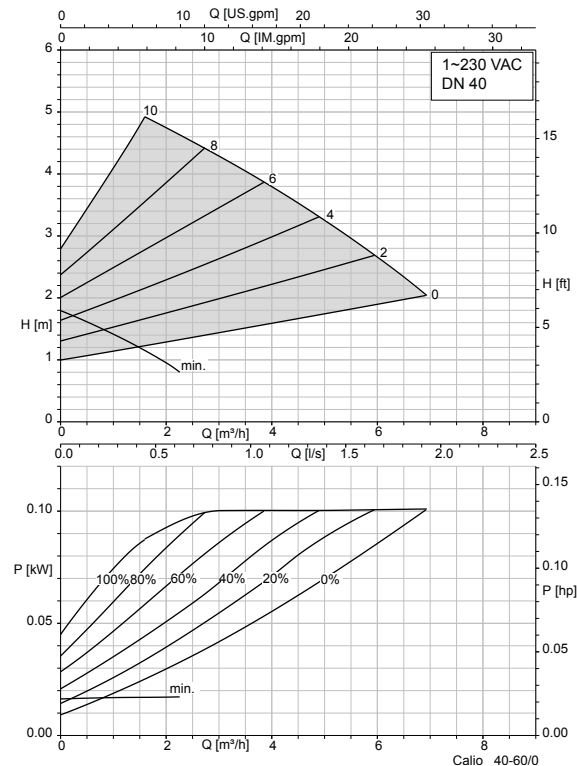
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E-mail: info@famcocorp.com

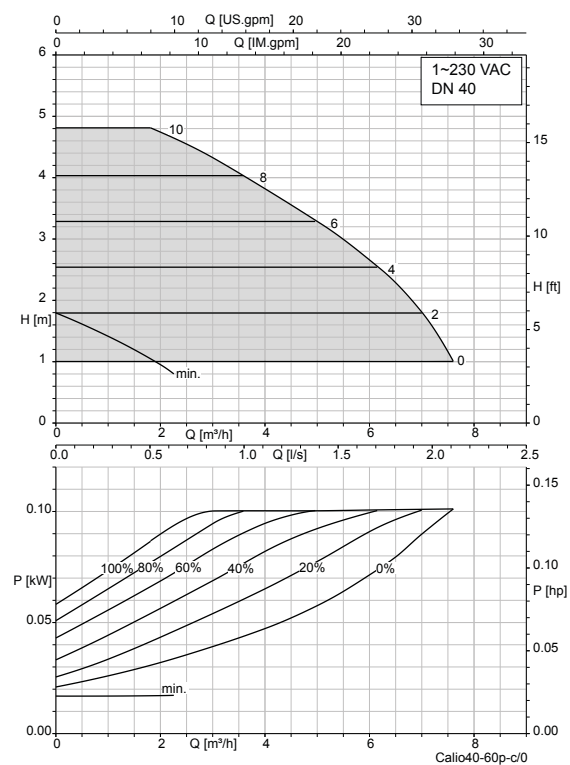
Calio 40-60, EcoMode



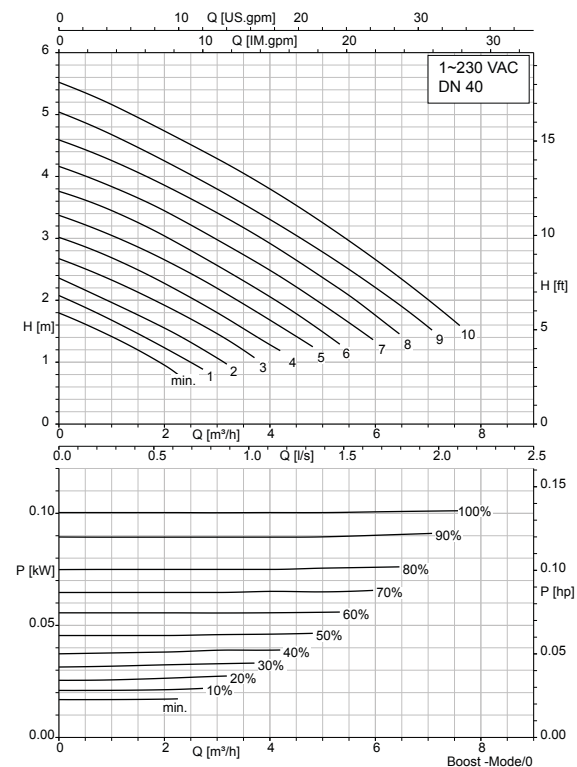
Calio 40-60, Δpv



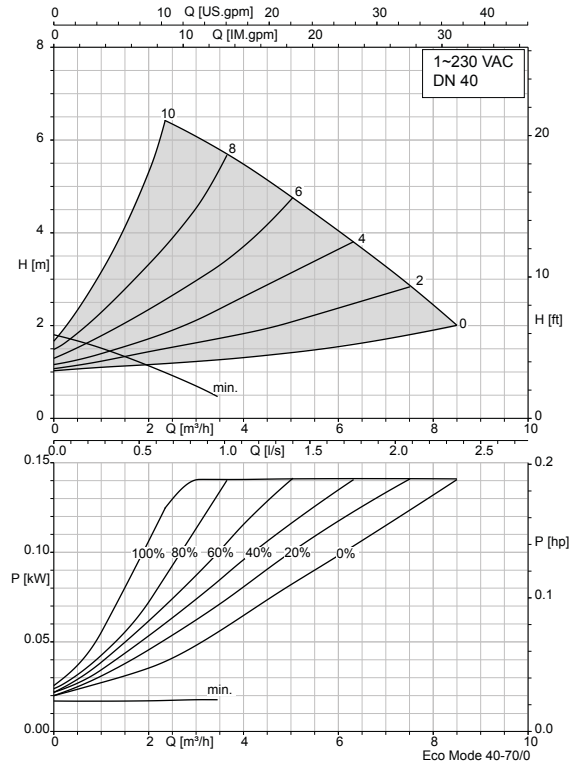
Calio 40-60, Δpc



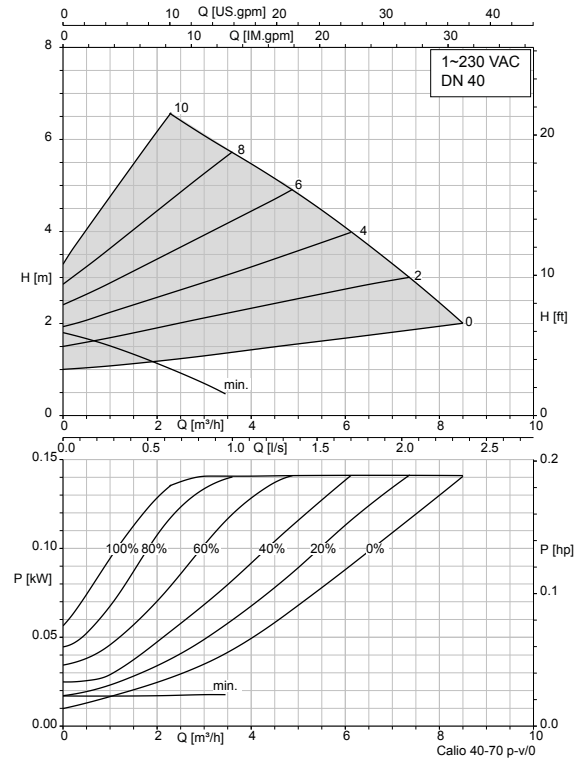
Calio 40-60, Boost



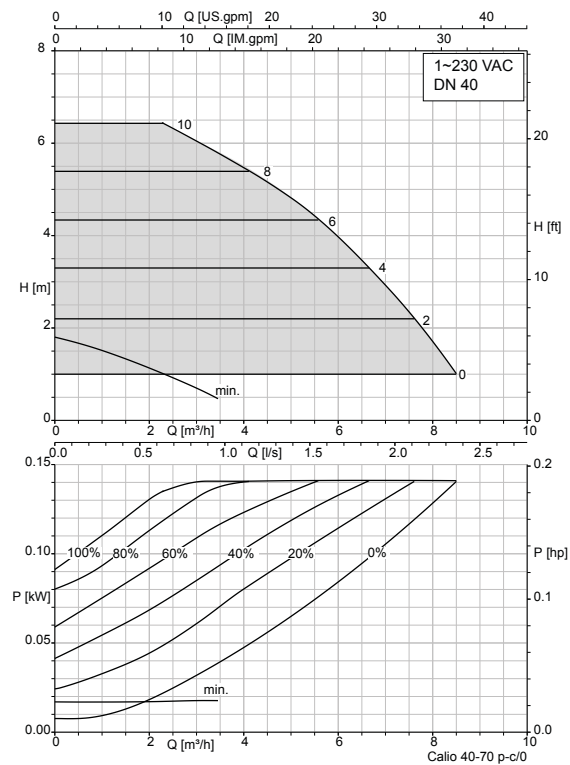
Calio 40-70, Eco Mode



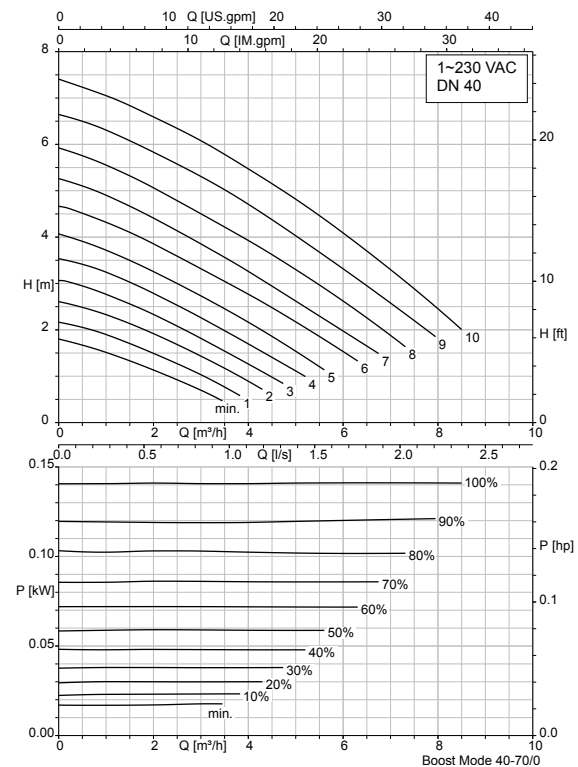
Calio 40-70, Δp_v



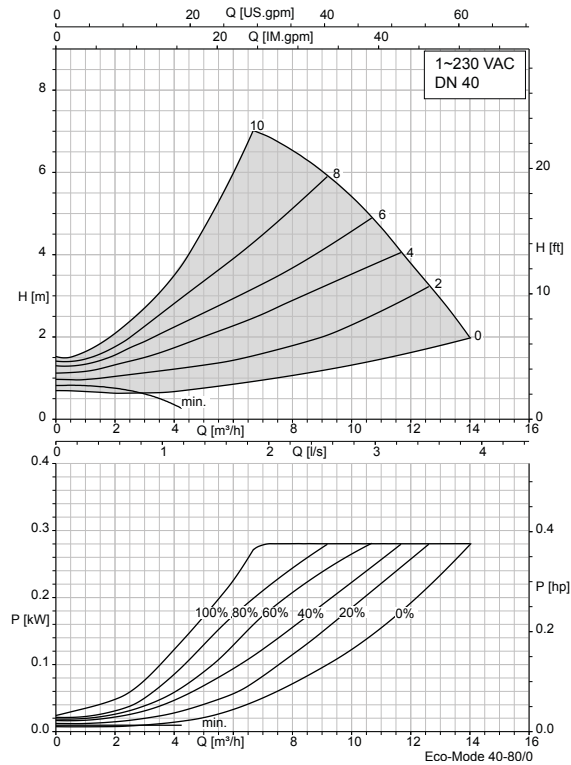
Calio 40-70, Δp_c



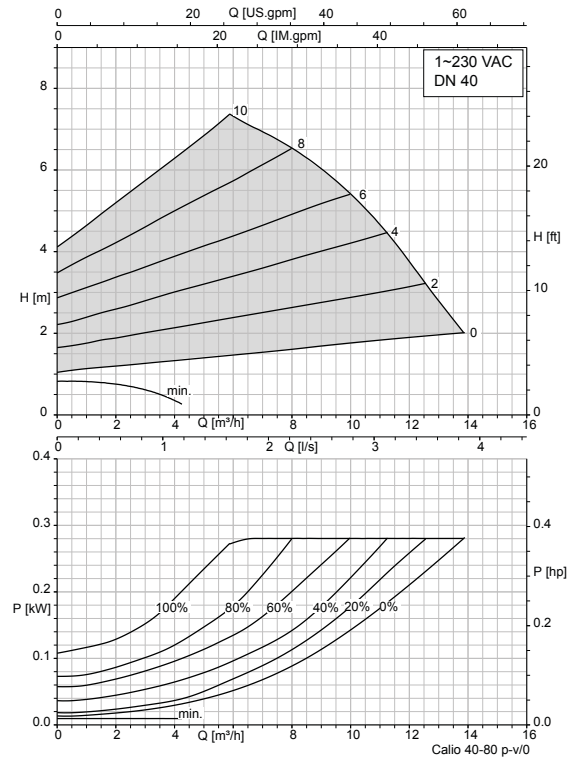
Calio 40-70, Boost



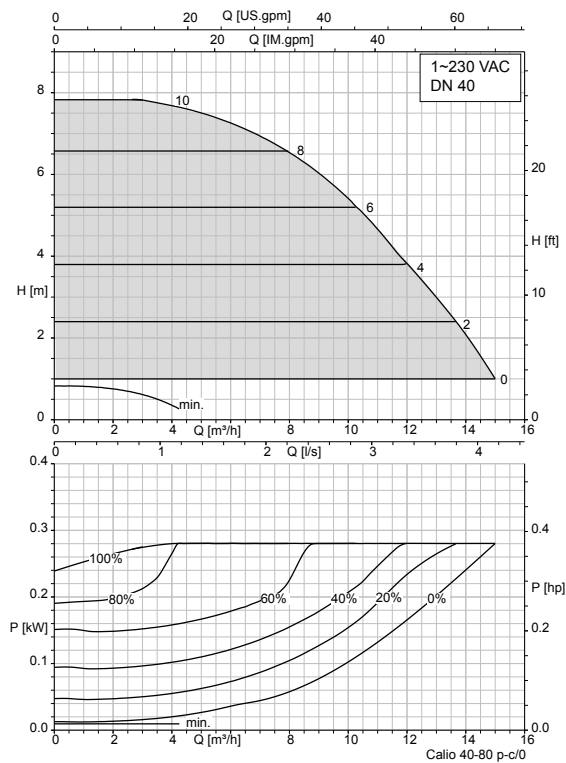
Calio 40-80, Eco Mode



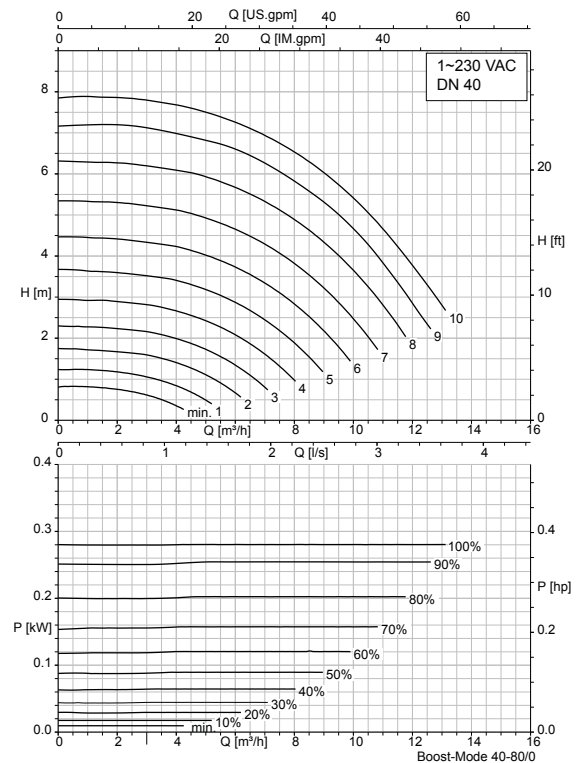
Calio 40-80, Δpv



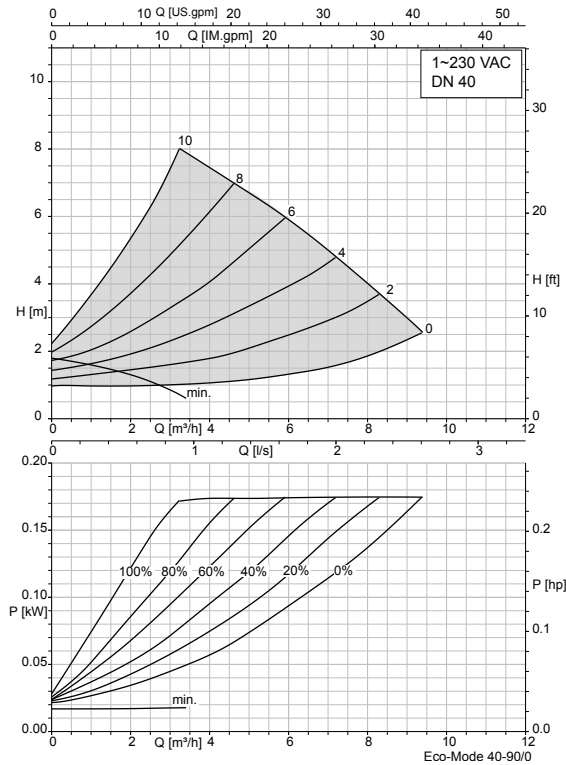
Calio 40-80, Δpc



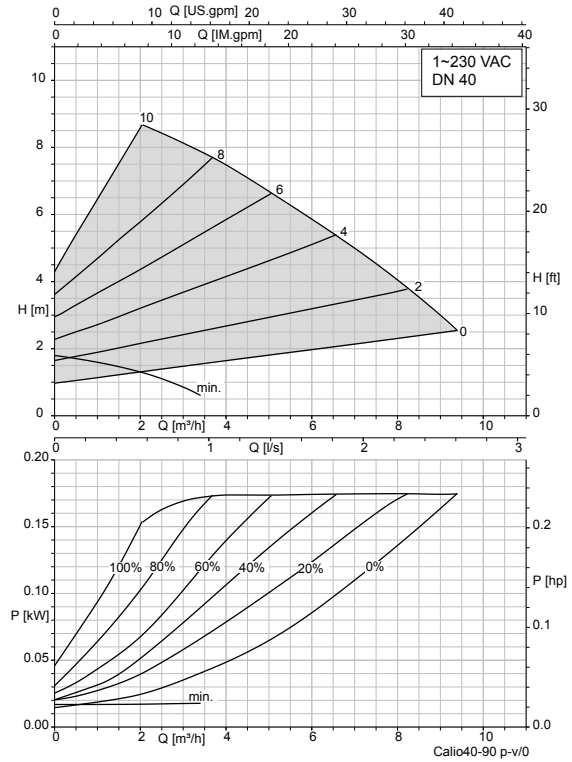
Calio 40-80 Boost



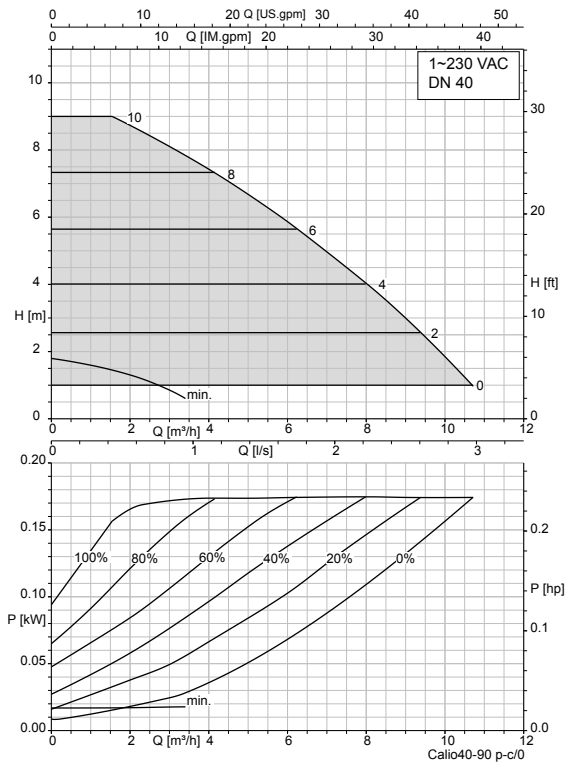
Calio 40-90, Eco Mode



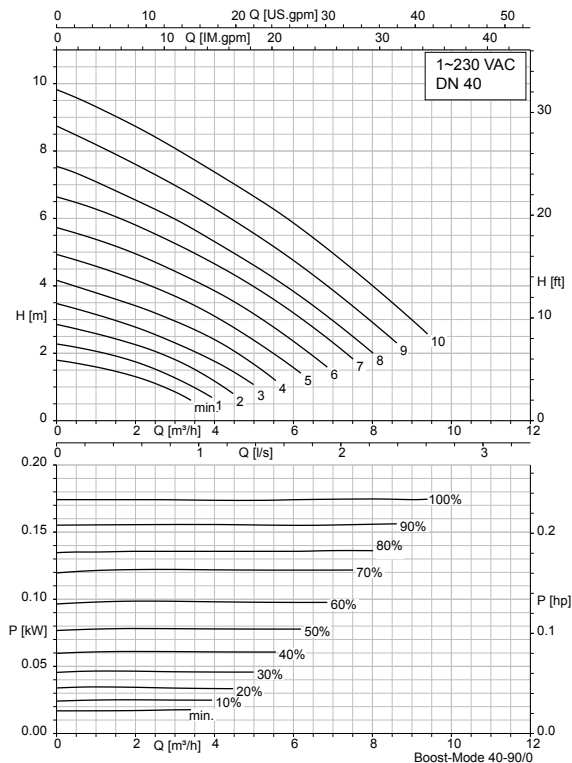
Calio 40-90, Δpv



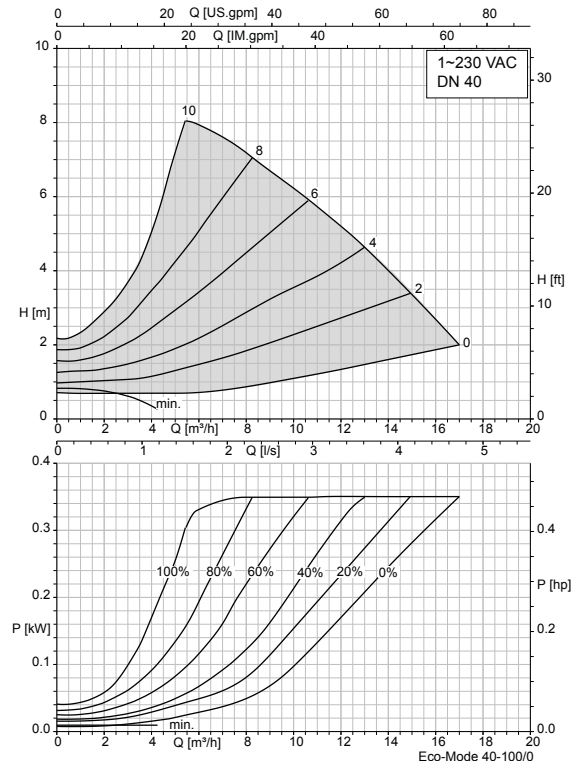
Calio 40-90, Δpc



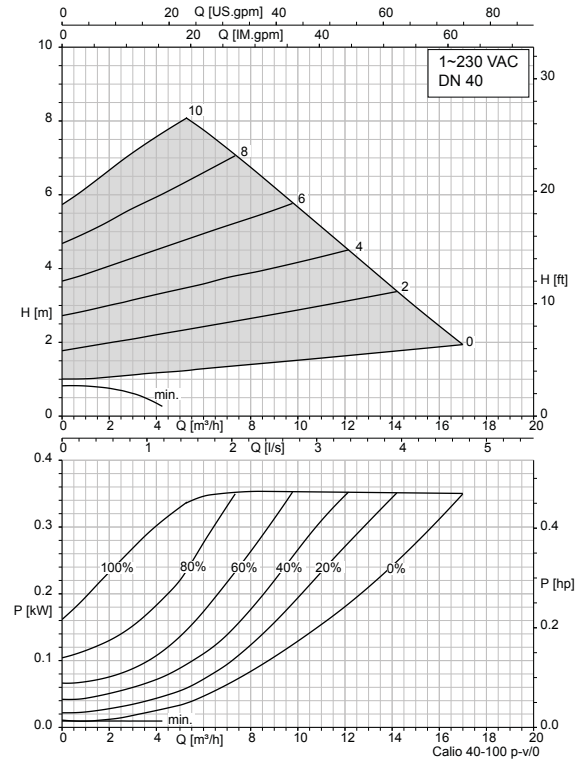
Calio 40-90, Boost



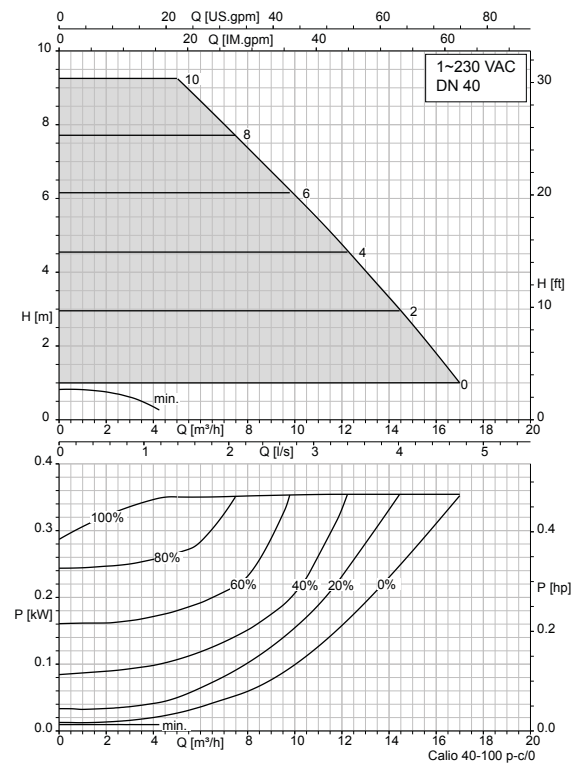
Calio 40-100, Eco Mode



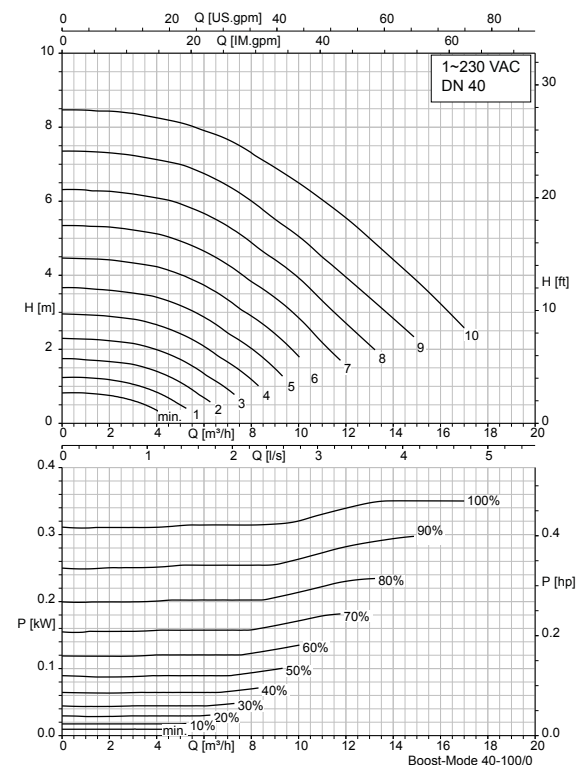
Calio 40-100, Δp_v



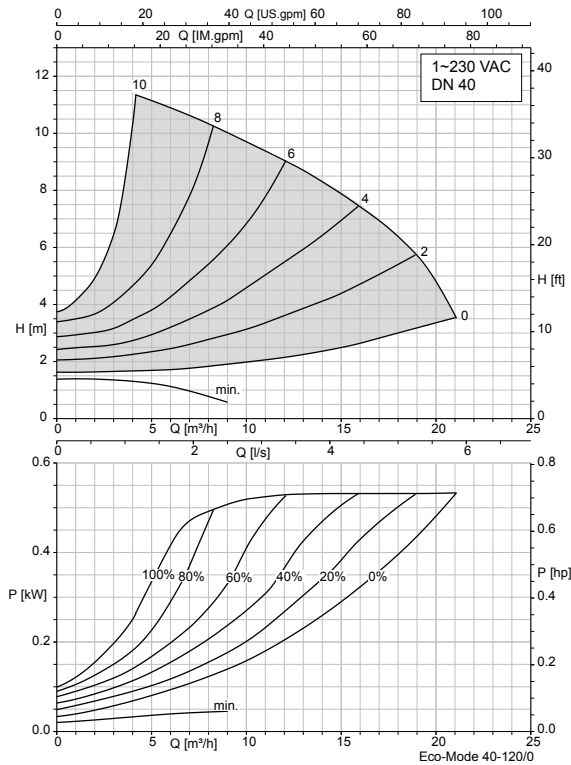
Calio 40-100, Δp_c



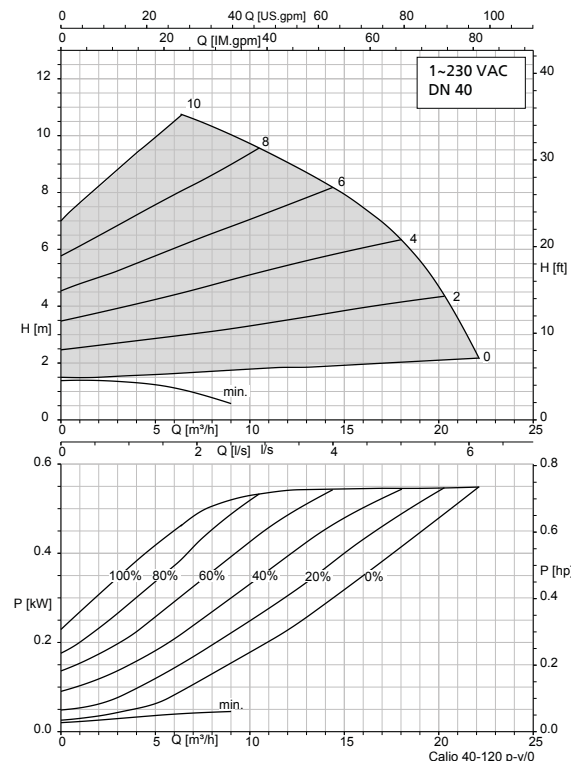
Calio 40-100, Boost



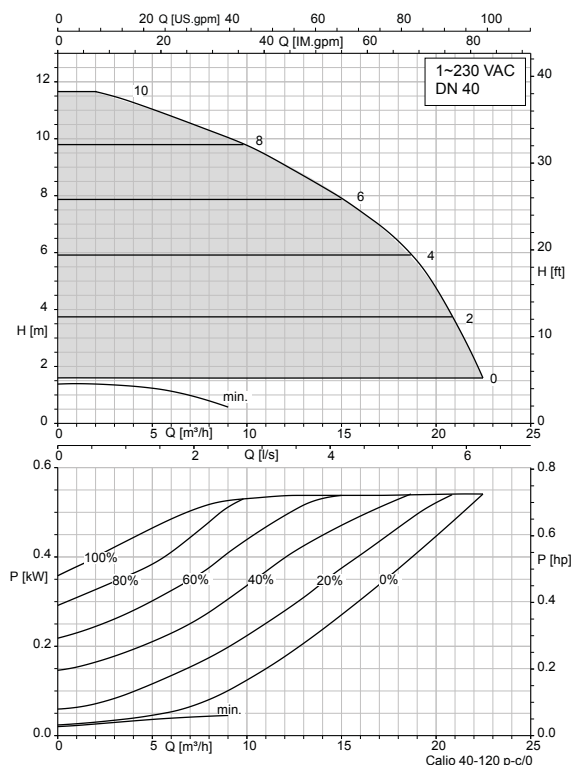
Calio 40-120, EcoMode



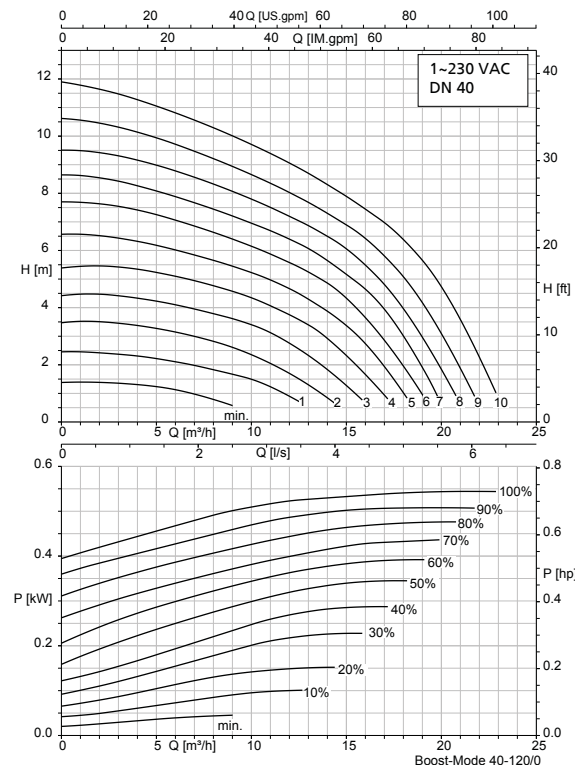
Calio 40-120, Δpv



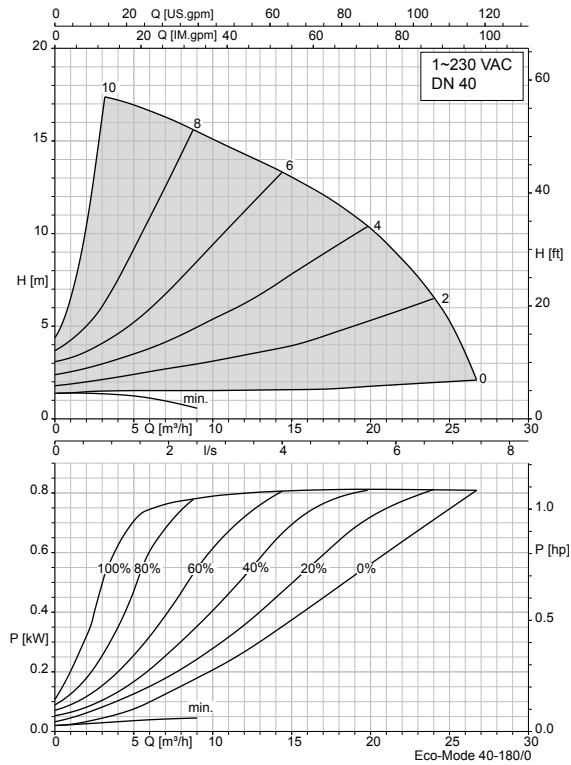
Calio 40-120, Δpc



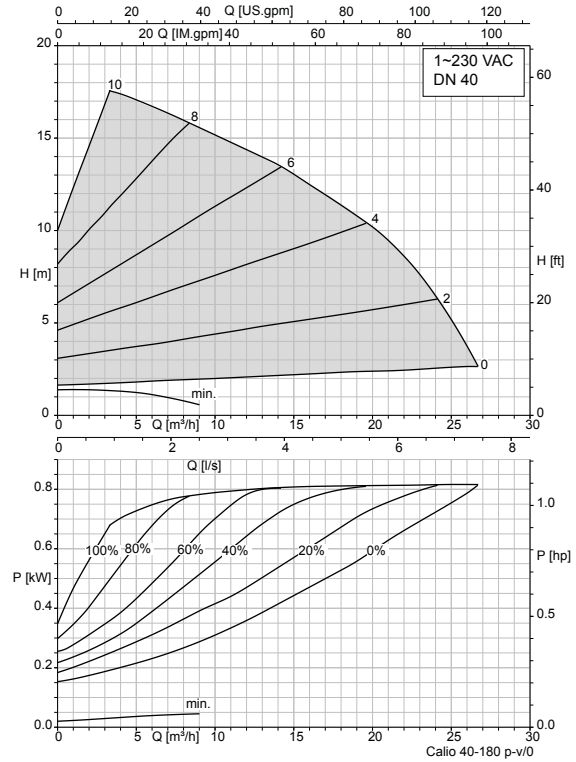
Calio 40-120, Boost



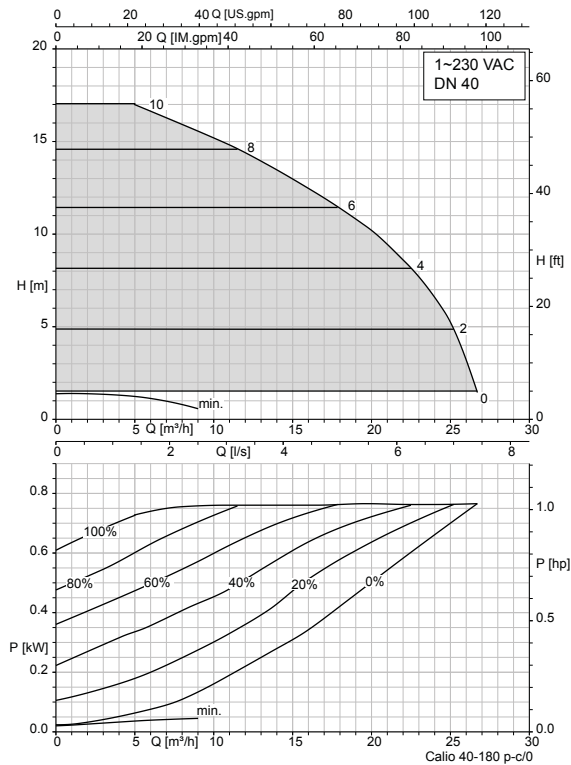
Calio 40-180, EcoMode



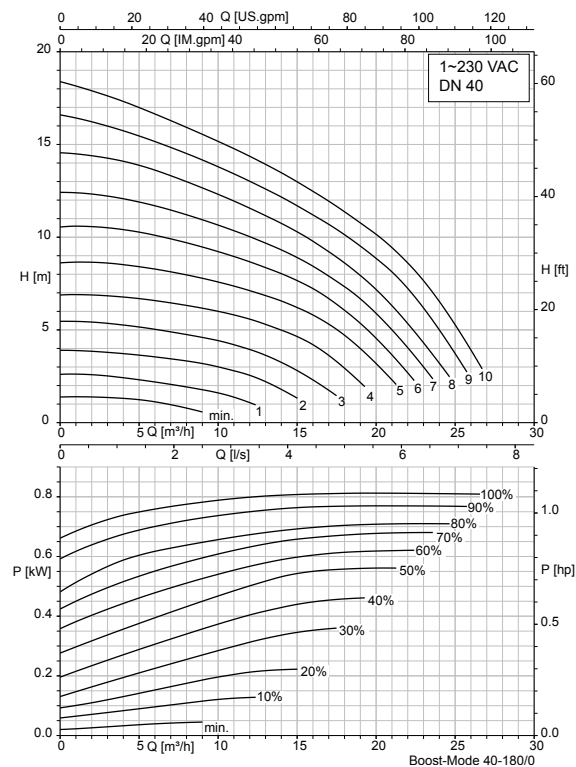
Calio 40-180, Δpv



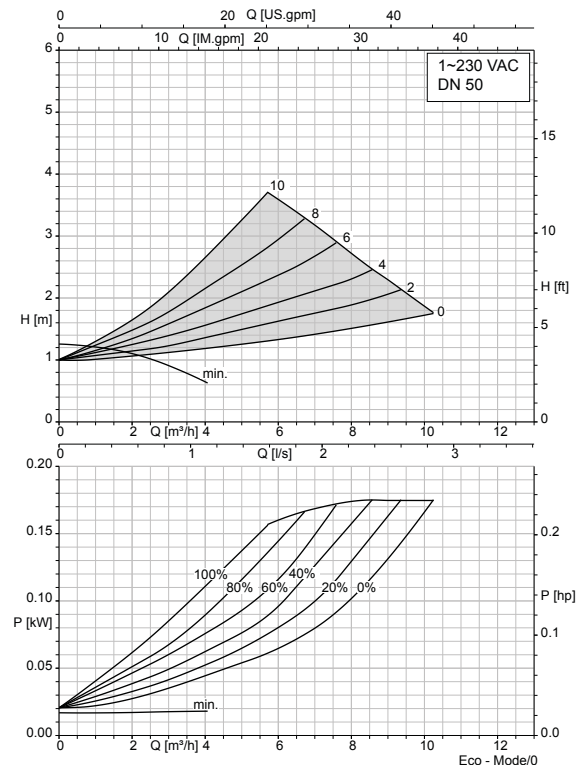
Calio 40-180, Δpc



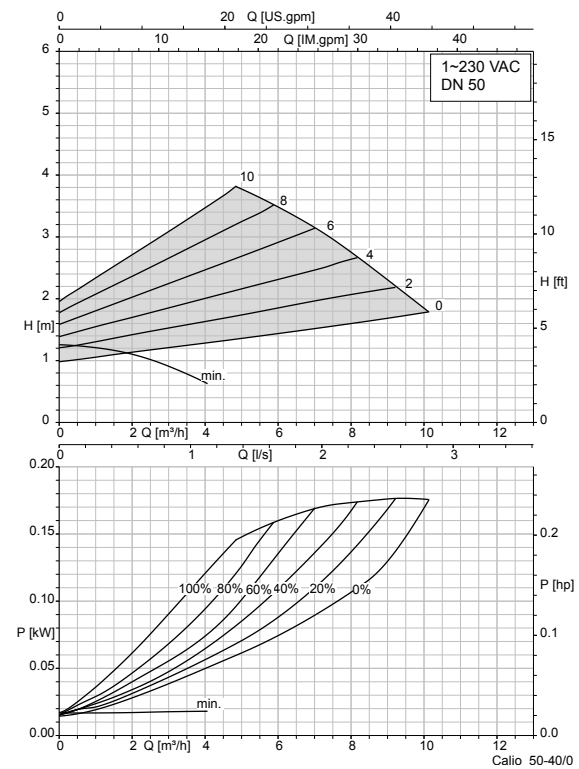
Calio 40-180, Boost



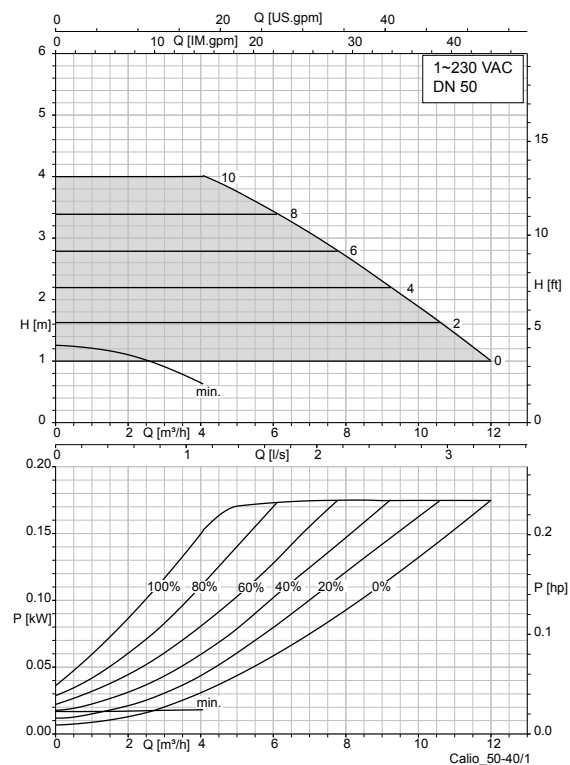
Calio 50-40, EcoMode



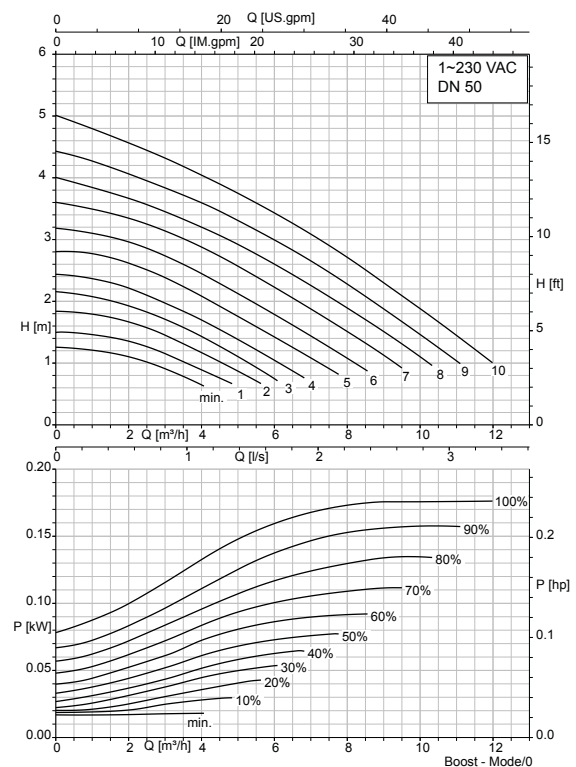
Calio 50-40, Δpv



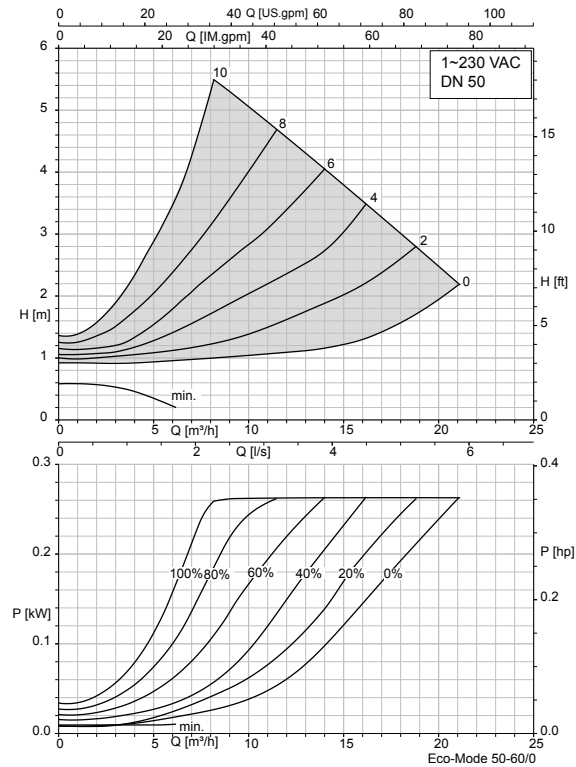
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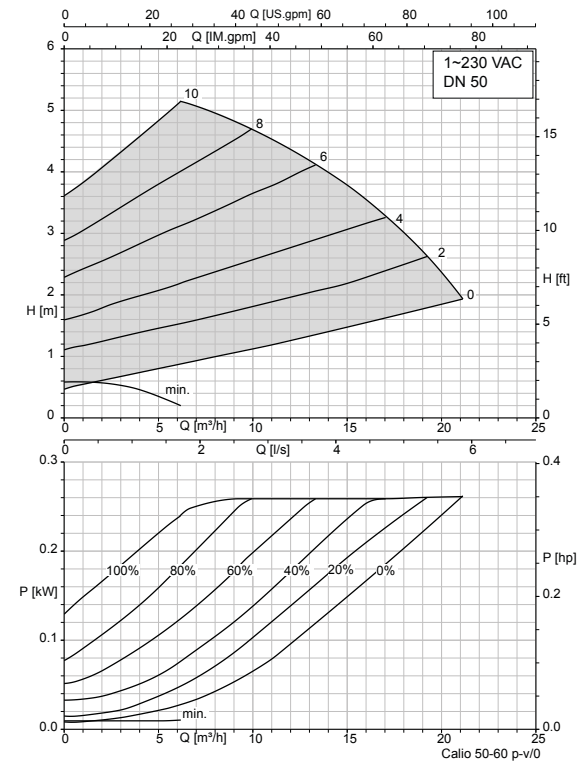
Calio 50-40, Boost



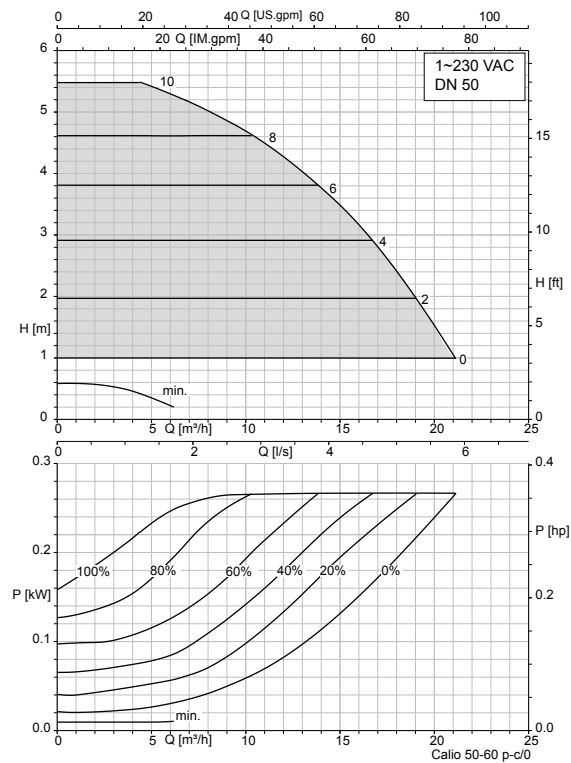
Calio 50-60, Eco Mode



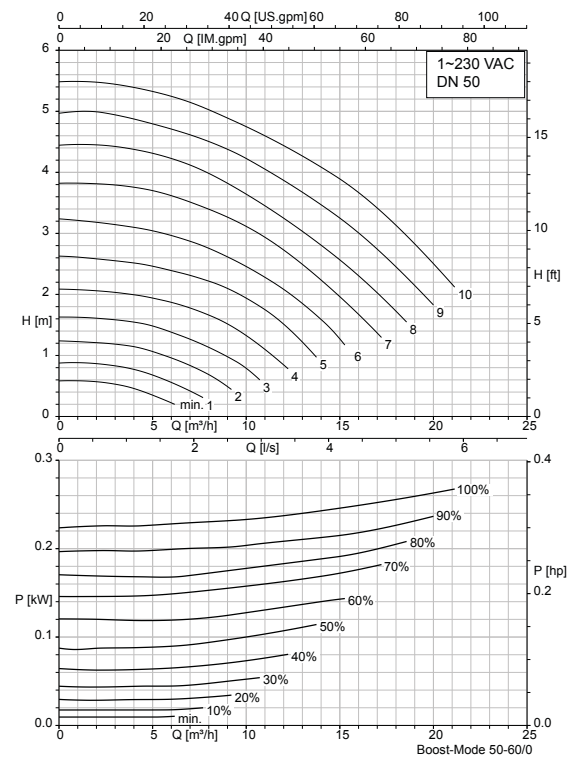
Calio 50-60, Δpv



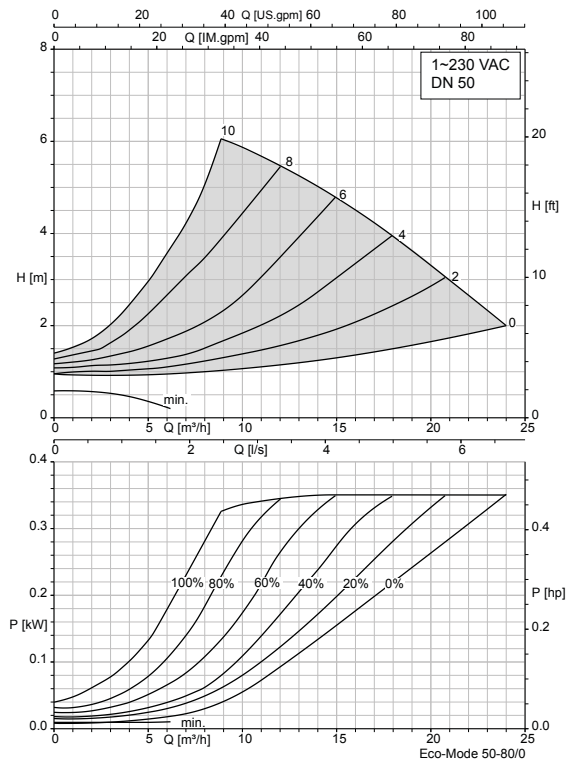
Calio 50-60, Δpc



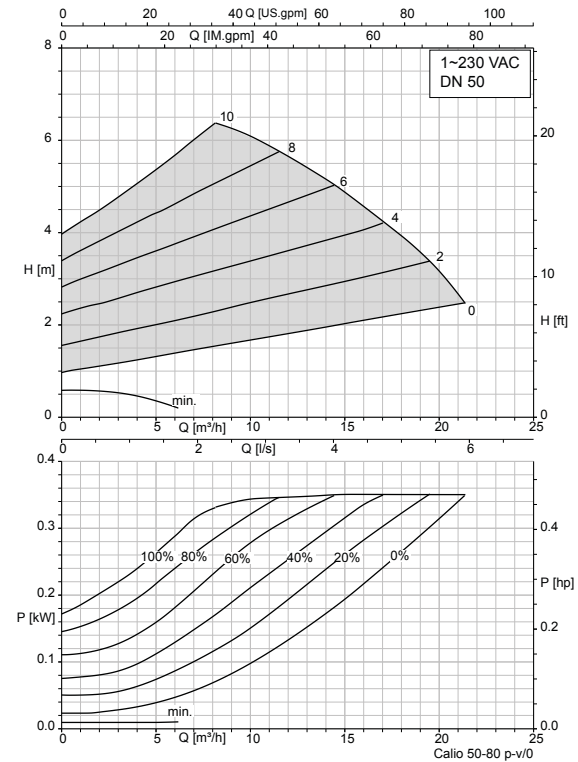
Calio 50-60, Boost



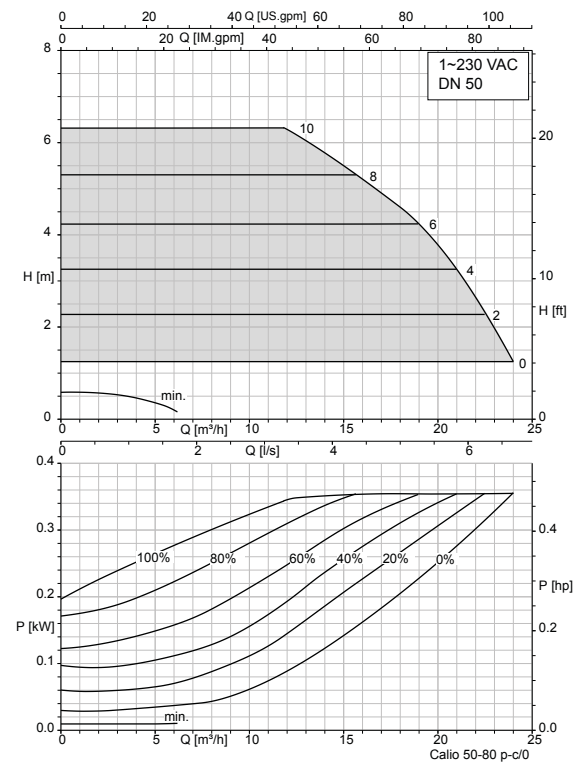
Calio 50-80, Eco Mode



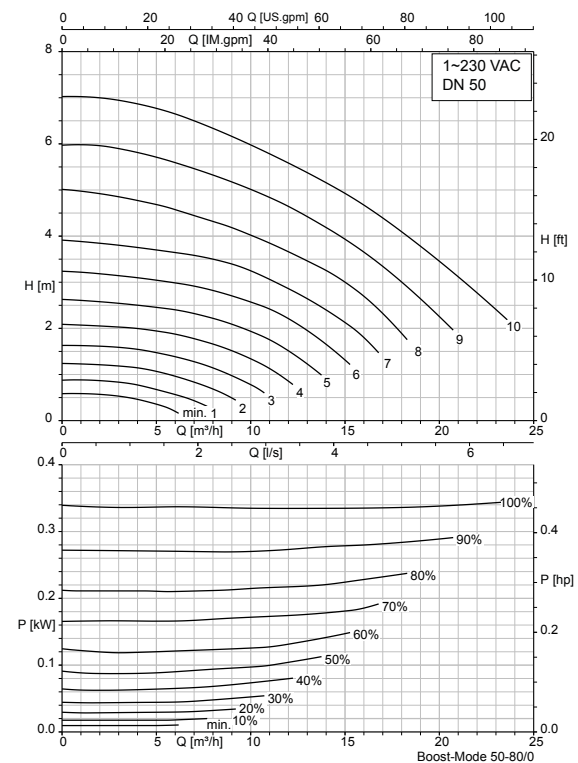
Calio 50-80, Δpv



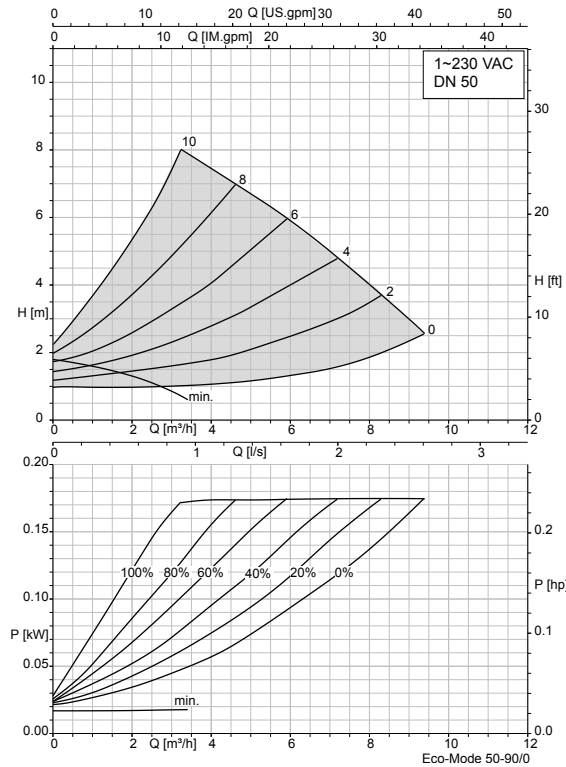
Calio 50-80, Δpc



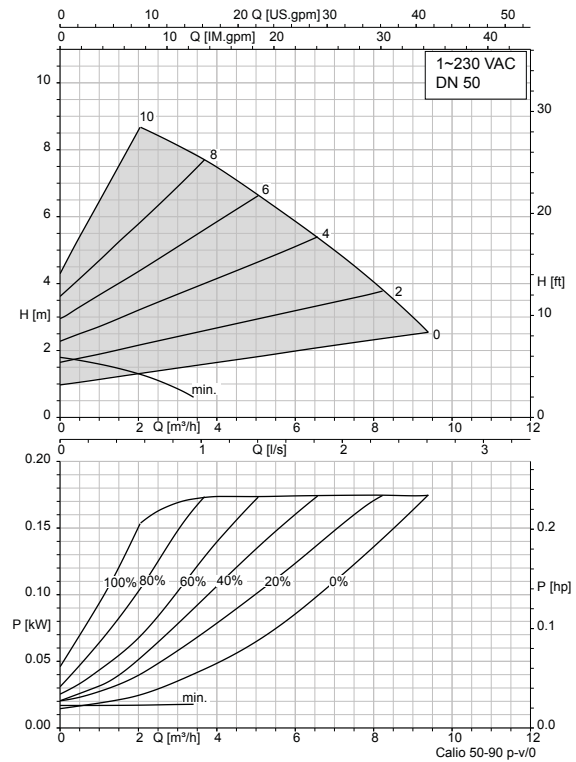
Calio 50-80, Boost



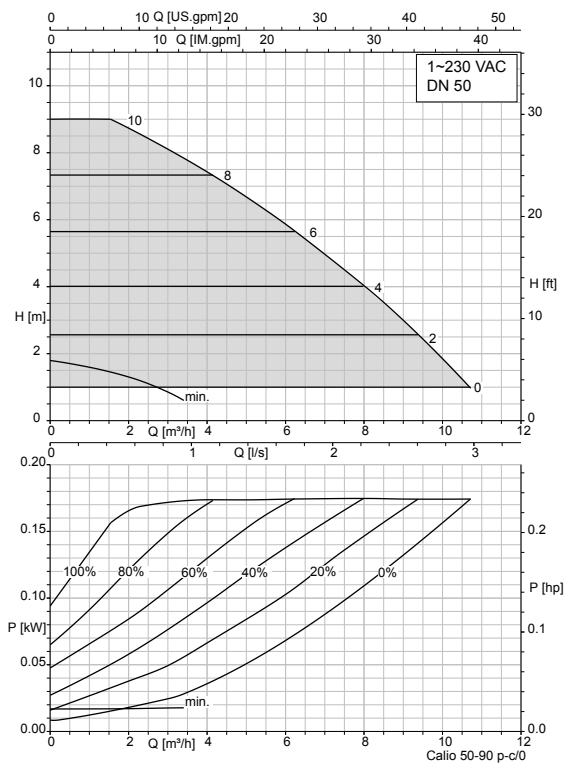
Calio 50-90, Eco Mode



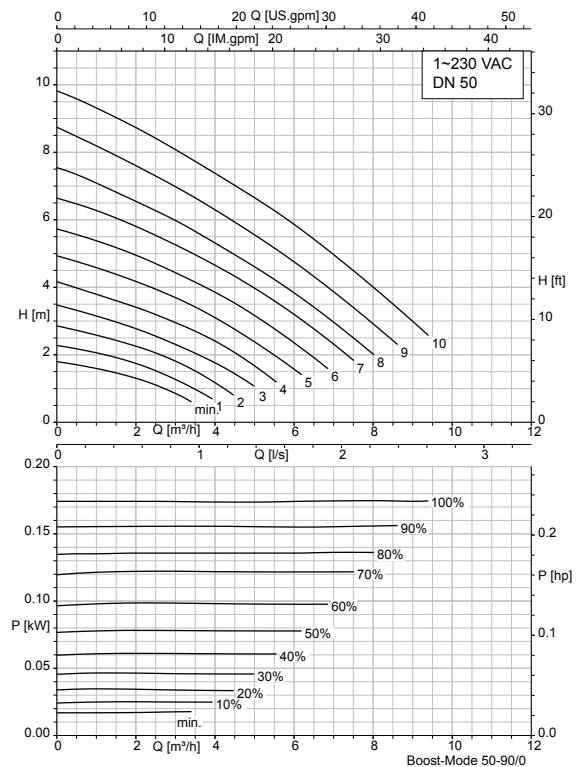
Calio 50-90, Δpv



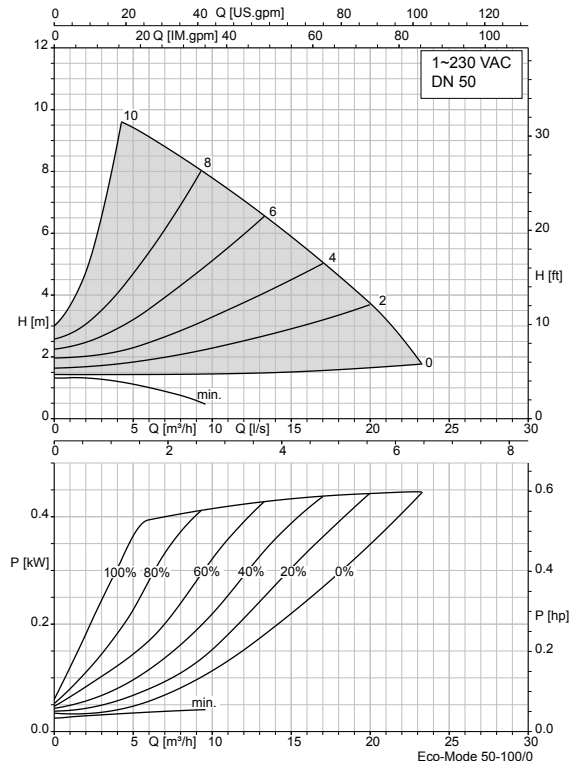
Calio 50-90, Δpc



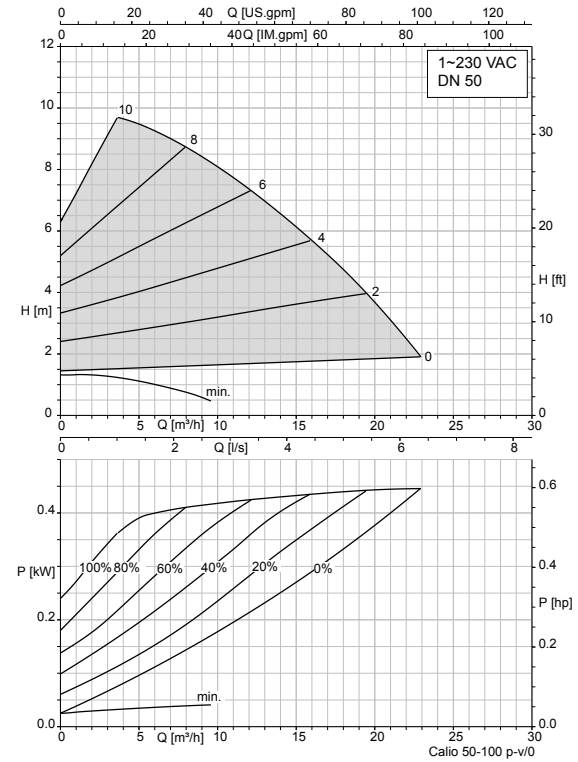
Calio 50-90, Boost



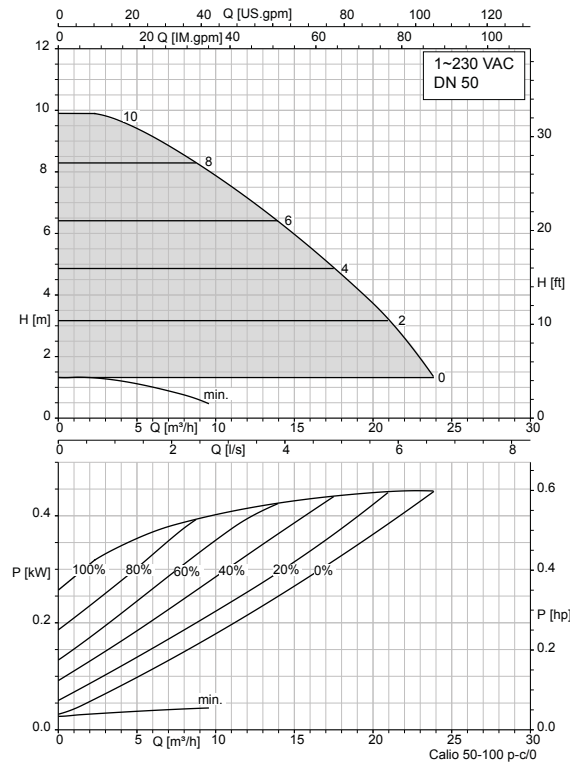
Calio 50-100, EcoMode



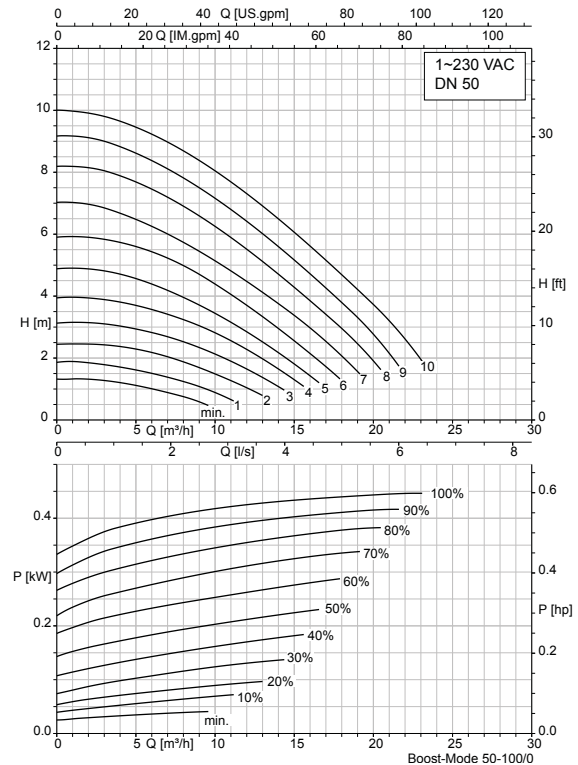
Calio 50-100, Δpv



Calio 50-100, Δpc



Calio 50-100, Boost

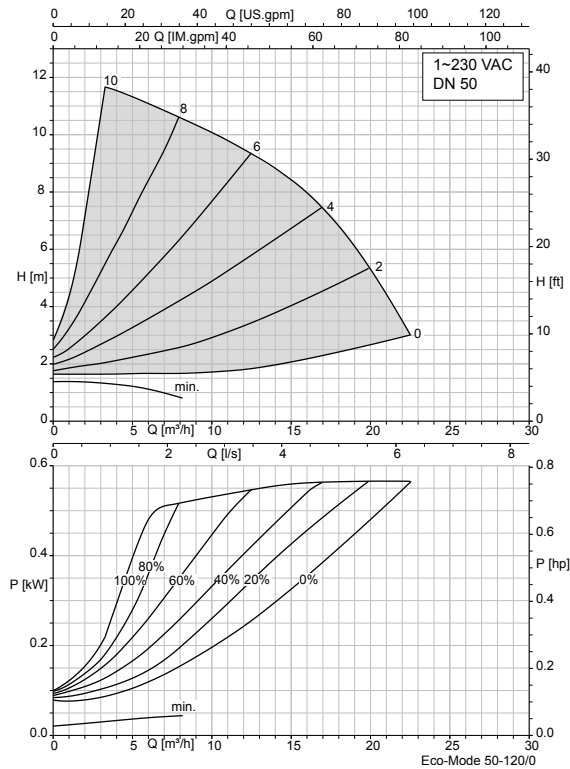


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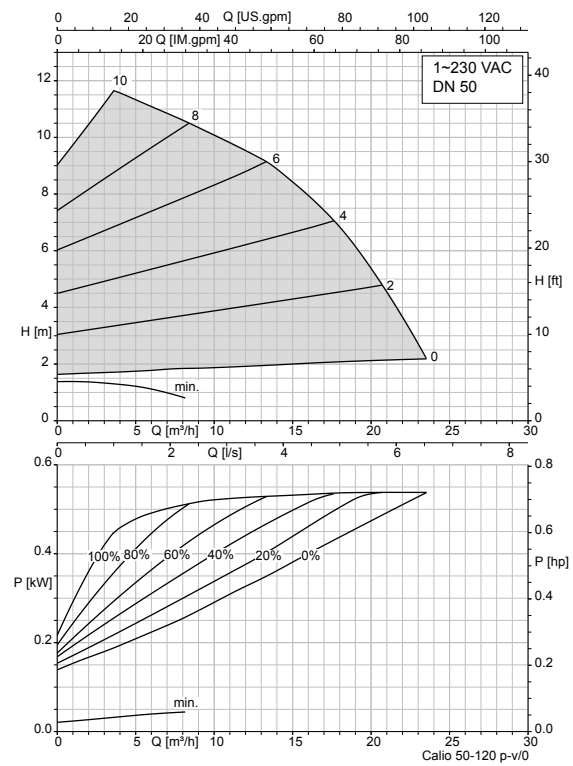
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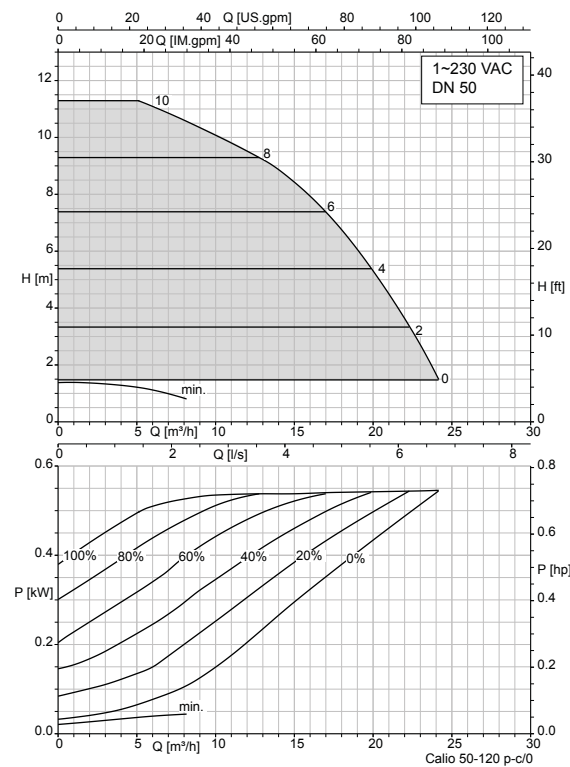
Calio 50-120, EcoMode



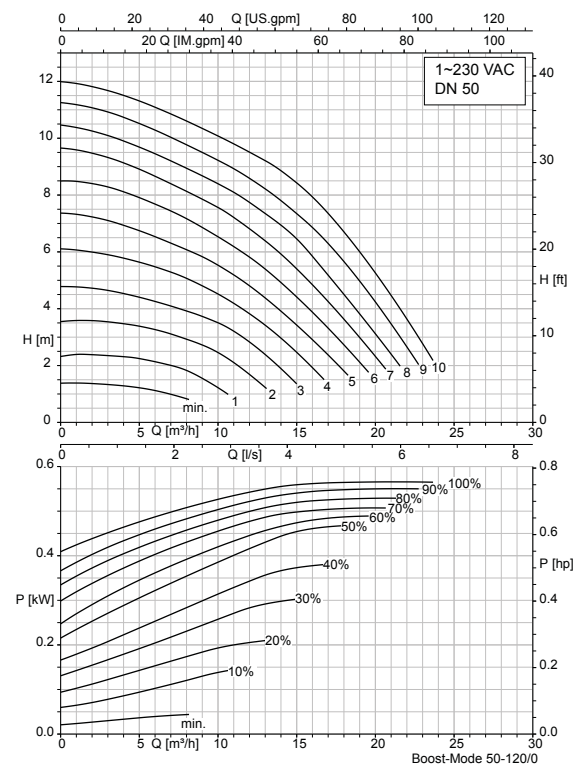
Calio 50-120, Δpv



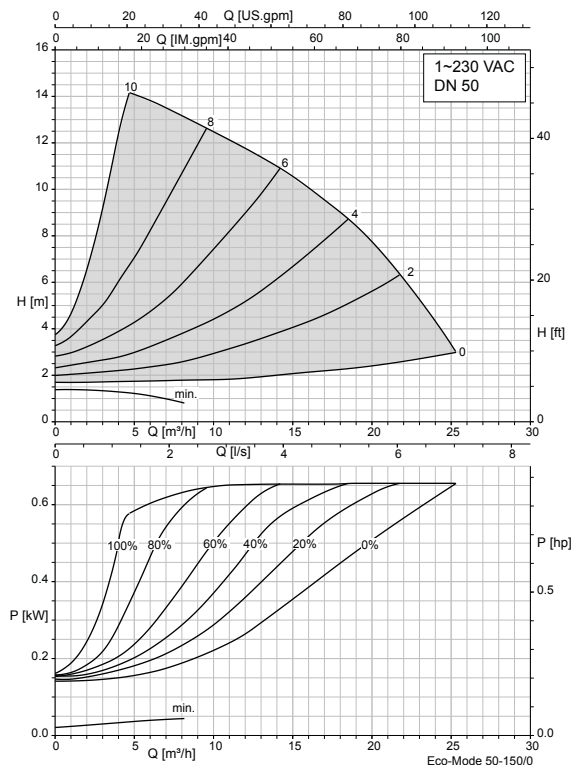
Calio 50-120, Δpc



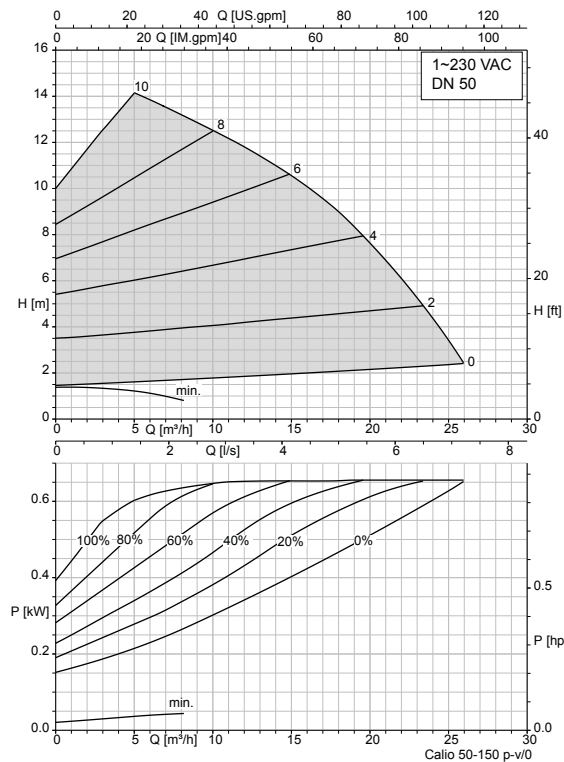
Calio 50-120, Boost



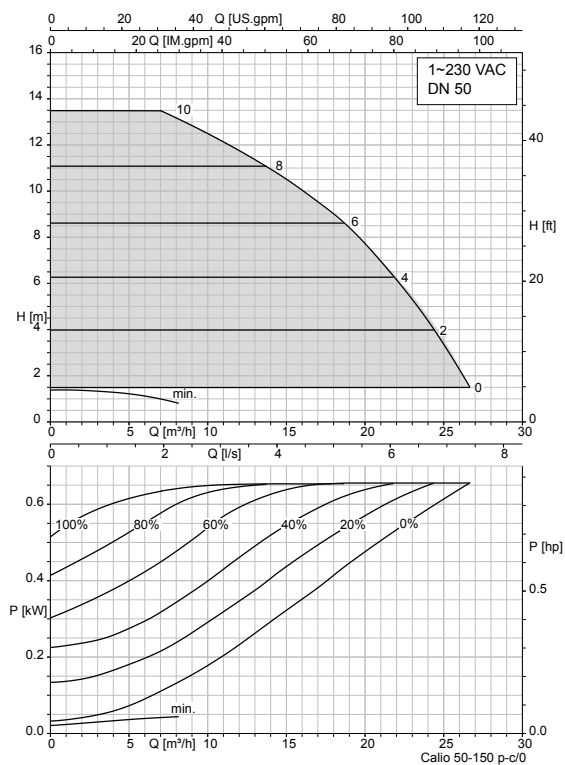
Calio 50-150, EcoMode



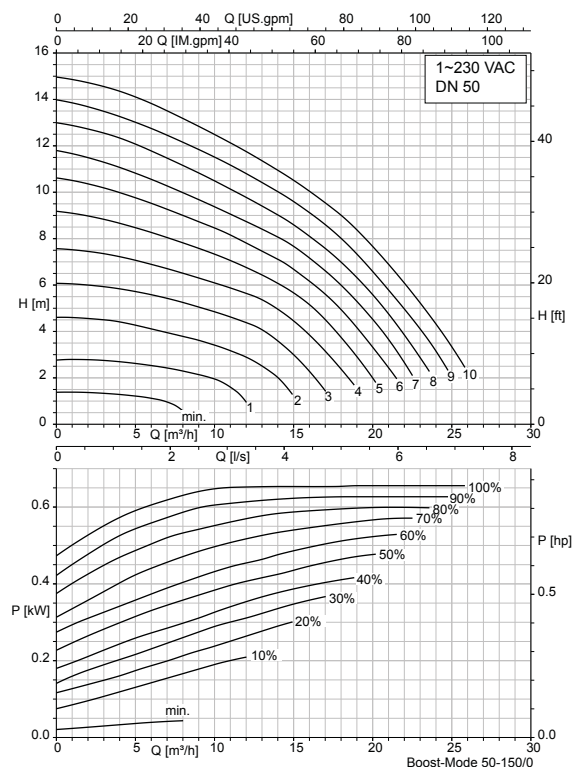
Calio 50-150, Δpv



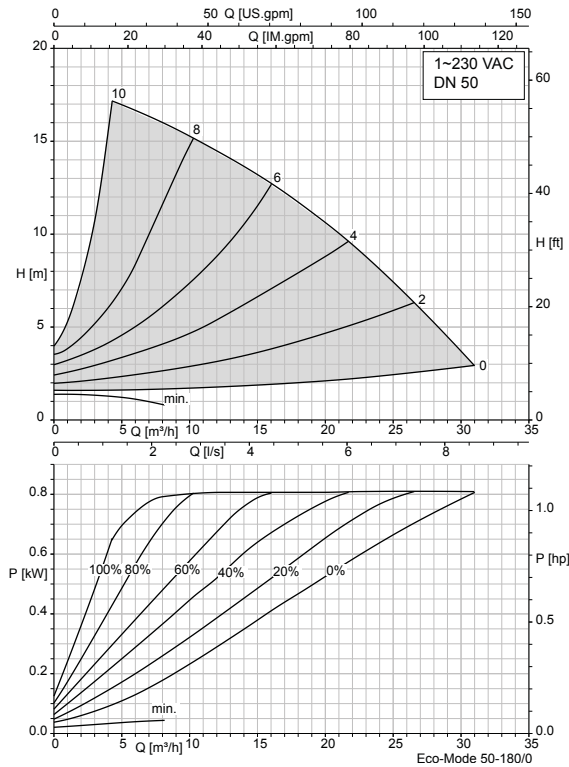
Calio 50-150, Δpc



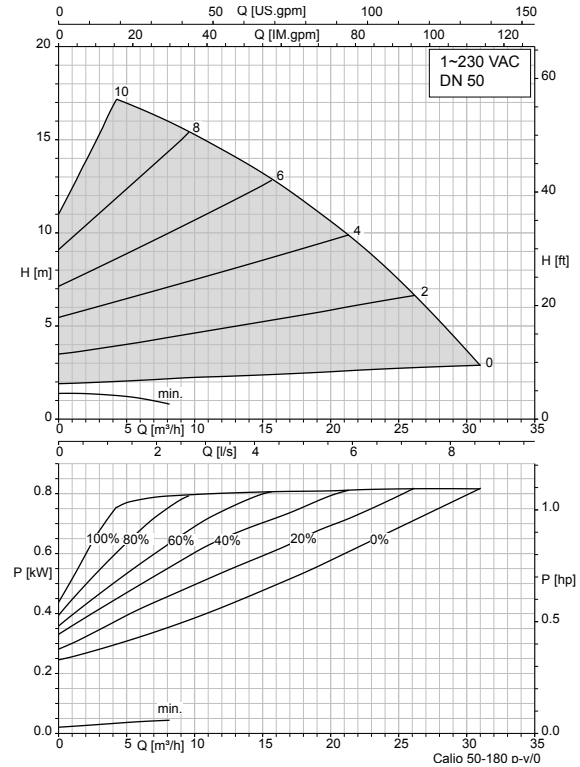
Calio 50-150, Boost



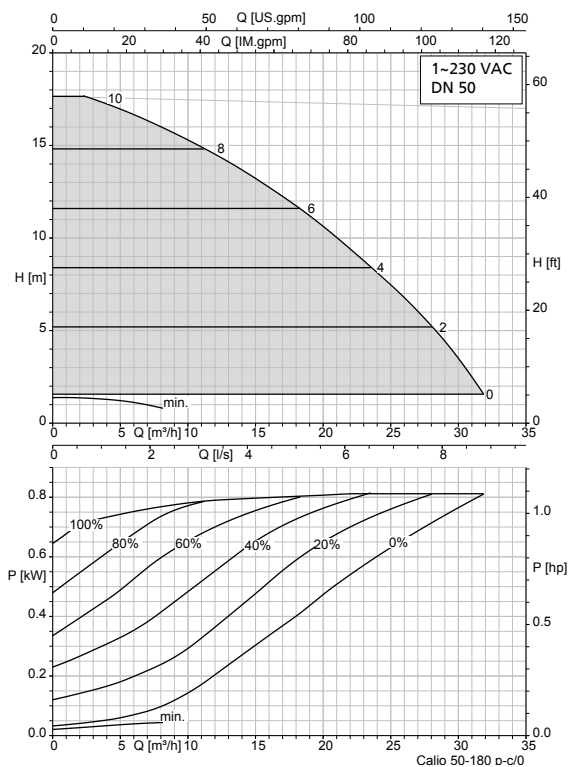
Calio 50-180, EcoMode



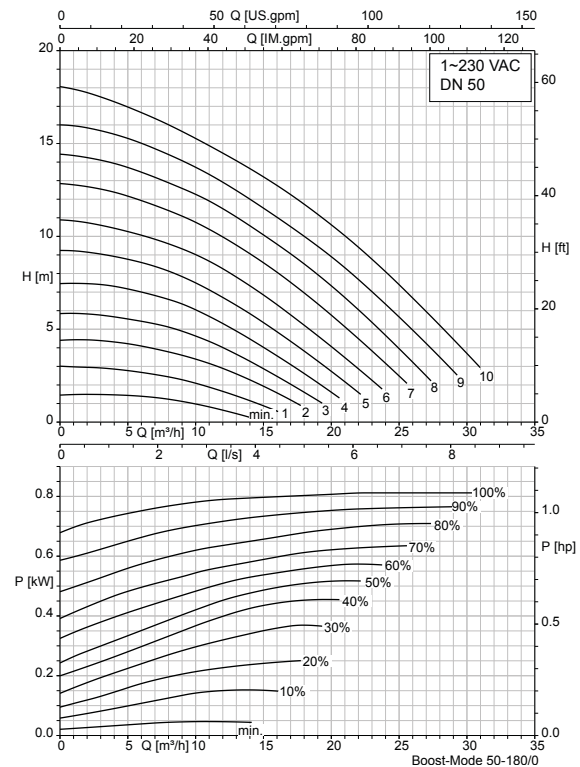
Calio 50-180, Δpv



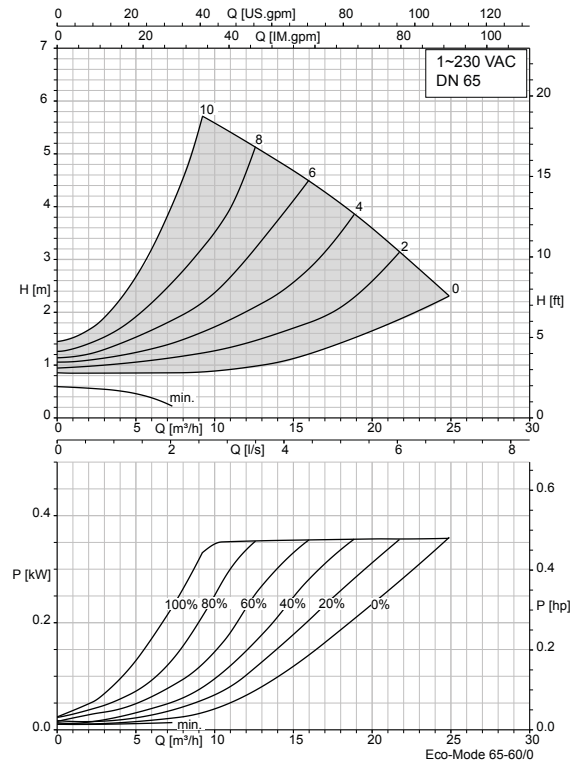
Calio 50-180, Δpc



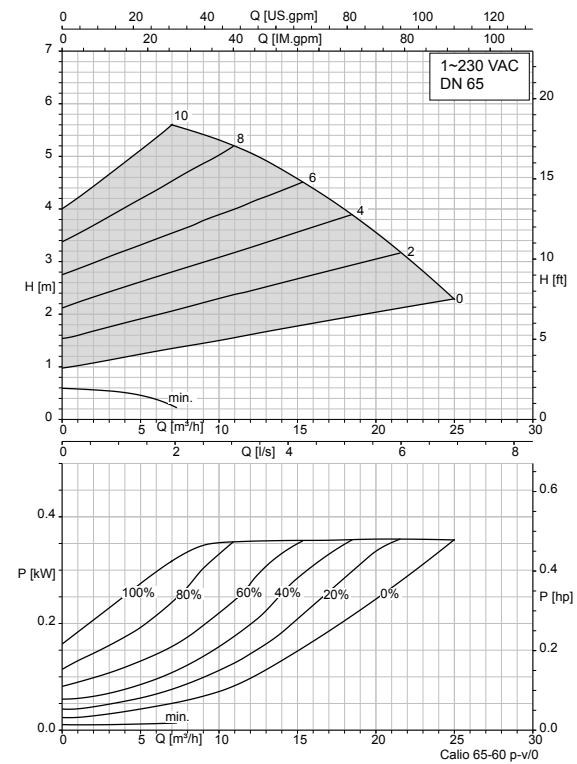
Calio 50-180, Boost



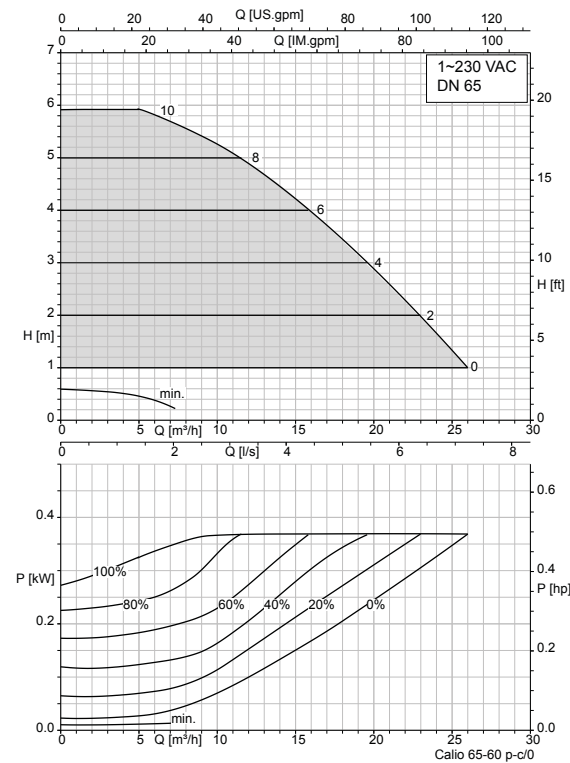
Calio 65-60, Eco Mode



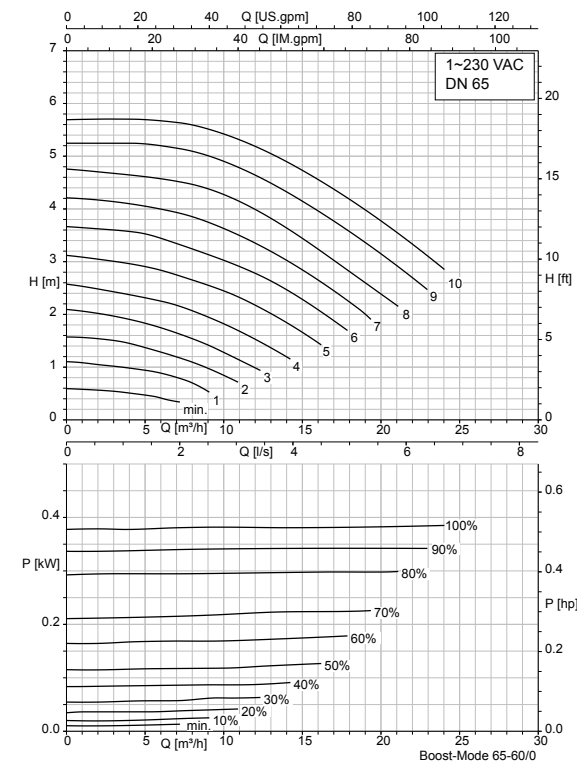
Calio 65-60, Δpv



Calio 65-60, Δpc

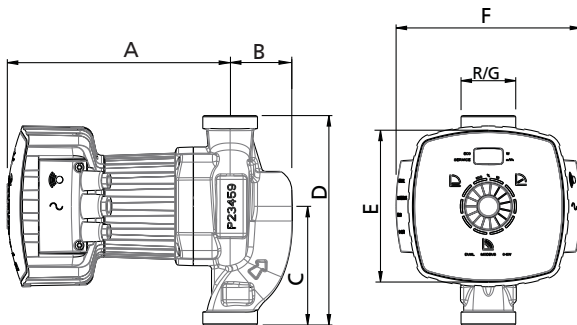


Calio 65-60, Boost

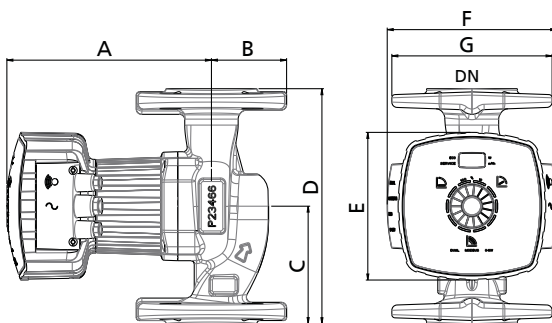


Dimensions

Calio



Screw-ended pumps



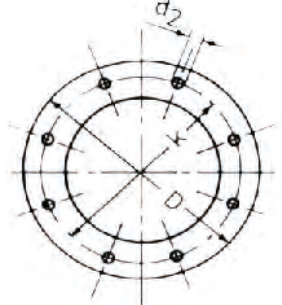
Flanged pumps

Dimensions [mm]

Calio	R	G	DN	A	B	C	D	E	F
25-60	1	1 1/2	-	192	53	102	180	140	160
25-80	1	1 1/2	-	192	53	102	180	140	160
25-100	1	1 1/2	-	192	53	102	180	140	160
30-60	1 1/4	2	-	192	53	102	180	140	160
30-80	1 1/4	2	-	192	53	102	180	140	160
30-100	1 1/4	2	-	192	53	102	180	140	160
30-120	1 1/4	2	-	192	56	98	180	140	160
32-120	-	140	32	245	65	110	220	140	160
40-60	-	150	40	192	70	110	220	140	160
40-70	-	150	40	192	70	110	220	140	160
40-80	-	150	40	255	70	120	220	140	160
40-90	-	150	40	192	70	110	220	140	160
40-100	-	150	40	255	70	120	220	140	160
40-120	-	150	40	382	76	135	250	206	240
40-180	-	150	40	382	76	135	250	206	240
50-40	-	165	50	192	78	120	240	140	160
50-60	-	165	50	256	78	130	240	140	160
50-80	-	165	50	256	78	130	240	140	160
50-90	-	165	50	192	78	120	240	140	160
50-100	-	165	50	382	77	140	280	206	240
50-120	-	165	50	382	77	140	280	206	240
50-150	-	165	50	382	77	140	280	206	240
50-180	-	165	50	382	77	140	280	206	240
65-60	-	185	65	257	89	170	340	140	160

Flange design

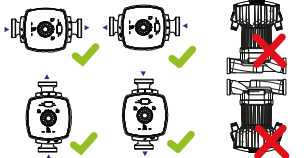
Dimensions [mm]

Adapter flange	PN 6			PN 10, PN 16			Outline drawing
	ØD	Øk	n x d ₂	ØD	Øk	n x d ₂	
DN 32	120	90	4 x Ø14	140	100	4 x Ø18	
DN 40	130	100	4 x Ø14	150	110	4 x Ø18	
DN 50	140	110	4 x Ø14	165	125	4 x Ø18	
DN 65	160	130	4 x Ø14	185	145	4 x Ø18	

Information on installation

Calio

Permissible installation positions

Sizes	
All	

Scope of supply

- Pump
- Sealing elements for threaded connection
- Installation/operating manual
- Thermal insulation

Accessories

Thermal insulation

Description	for pump size	Mat. No.	[kg]
Diffusion-tight thermal insulation for heating and cooling applications	25/.., 30/..	19075685	0.077
	40/..	19075686	0.133
	50/..	19075687	0.192

Screwed connections

	Description	Mat. No.	[kg]
	2 screwed connections with G 1 1/2 union nut and insert with Rp 3/4 internal thread, steel for pumps with G 1 1/2 external thread / R 3/4 pipe connection	19075560	0.2
	2 screwed connections with G 1 1/2 union nut and insert with Rp 1 internal thread, steel for pumps with G 1 1/2 external thread / R 1 pipe connection	19075561	0.2
	2 screwed connections with G 2 union nut and insert with Rp 1 1/4 internal thread, steel for pumps with G 2 external thread / R 1 1/4 pipe connection	19075562	0.2

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Spacers (flange)

	Description	Mating dimension flange	PN	Length	Mat. No.	[kg]
	Spacer F0	DN 40	6/10	70 mm	19075566	2
	Spacer F1	DN 50	6/10	10 mm	19075567	2
	Spacer F2	DN 50	6/10	20 mm	19075568	2
	Spacer F3	DN 50	6/10	50 mm	19075569	2
	Spacer F4	DN 50	6/10	60 mm	19075570	2
	Spacer F5	DN 65	6/10	10 mm	19075571	2
	Spacer F6	DN 65	6/10	25 mm	19075572	2
	Spacer F7	DN 65	6/10	30 mm	19075573	2
	Spacer F8	DN 80	6/10	10 mm	19075574	2
	Spacer F9	DN 80	6/10	15 mm	19075575	2
	Spacer F10	DN 80	6/10	20 mm	19075576	2
	Spacer F11	DN 80	6/10	25 mm	19075577	2
	Spacer F12	DN 80	6/10	30 mm	19075578	2
	Spacer F13	DN 80	6/10	40 mm	19075579	2
	Spacer F14	DN 80	6/10	40 mm	19075580	2
	Spacer F15	DN 80	6/10	80 mm	19075581	2

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تهران - کیلومتر ۲۱ جاده مخصوص کرج - روبروی
پالایشگاه نفت پارس، پلاک ۱۲

نماد پویایی در صنعت

High-efficiency Circulator Pump

Calio S

Type Series Booklet



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Type Series Booklet Calio S

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Building Services: Heating

Variable-Speed Circulator Pumps

Calio S



Main applications

Heating, ventilation, air-conditioning and circulation systems

- One-pipe and two-pipe systems
- Underfloor heating systems
- Boiler or primary circuits
- Storage tank circuits
- Solar power systems
- Heat pumps

Fluids handled

- Heating water to VDI 2035
Can handle higher-viscosity fluids (e.g. water/glycol mixture up to mixing ratio of 1:1)
- Pure, thin, non-aggressive and non-explosive 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	
		Calio S	Calio S BMS
Flow rate	Q [m ³ /h]	≤ 3.5	≤ 7
	Q [l/s]	≤ 1.0	≤ 1.95
Head	H [m]	≤ 6	
Fluid temperature ¹⁾	T [°C]	2 to 95	-10 to +110
Ambient temperature	T [°C]	0 to 40	
Operating pressure	p [bar]	≤ 10	

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

Characteristic		Value	
		Calio S	Calio S BMS
Sound pressure level	[dB (A)]	< 45	
Piping connection		R 1/2, R 1, R 1 1/4	

Designation

Example: Calio S 25-40-130

Designation key

Code	Description
Calio S	High-efficiency pump
25	Nominal diameter of pipe connection 15 = R 1/2 25 = R 1 30 = R 1 1/4
40	Head in m x 10 (example: 4 m = 40)
-130	Overall length 130 mm
BMS	Building Management System

Design details

Design

- Highly efficient, maintenance-free wet rotor pump (glandless)
- Screw-ended

Drive

- High-efficiency electric motor with continuously variable differential pressure control
- Electronically commutated synchronous motor with permanent magnet rotor
- 230 V - 50/60 Hz
- Thermal class F

Calio S:

- IP42 enclosure
- Temperature class TF 95
- Interference emission EN 55014-1
- Interference immunity EN 55014-2

Calio S BMS:

- IP44 enclosure
- Temperature class TF 110
- Interference emissions EN 61 000-6-3
- Interference immunity EN 61 000-6-2

Bearings

- Product-lubricated special plain bearing

Operating modes

- Automatic mode with constant-pressure or proportional-pressure control
- Fixed-speed operation with manual setpoint input

Calio S BMS:

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

Automatic functions

- Continuous output adjustment depending on the operating mode
- 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

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

Calio S BMS:

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

Signalling and display functions

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

Materials

Overview of available materials

Component	Material	
	Calio S	Calio S BMS
Volute casing	Grey cast iron with cathodic electrocoating	
Shaft	Ceramics	Stainless steel 1.4034
Impeller	Plastic with glass fibre content (PA - GF 35)	Plastic with glass fibre content (PSU - GF30)
Bearing	Ceramics	Ceramics/carbon
Bearing plate	Stainless steel 1.4301	
Can	Stainless steel 1.4301	
Thermal insulation shells	Polypropylene	

Product benefits

Calio S

- Maximum savings of operating costs by high-efficiency technology combined with speed control
- Future-proof by maximum energy efficiency, exceeding future energy efficiency regulations such as ErP2015
- Easy to use with a combination of control keys, integrated display and symbols showing the operating status
- High availability by manual and integrated protective functions
- Compact dimensions and KSB plug make the pumps easy to install. Thermal insulation shell included in the scope of supply.

Calio S BMS

- Maximum savings of operating costs by high-efficiency technology combined with speed control
- Future-proof by maximum energy efficiency, exceeding future energy efficiency regulations such as ErP2015
- 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 for additional savings of more than 40% compared with proportional-pressure control.
- Thermal insulation shell included in scope of supply

Certifications

Overview

Label	Valid in:	Comment
	Europe	Calio S 15...-40 EEI ≤ 0.20 Calio S 15...-60 EEI ≤ 0.23 Calio S 25/30-60 BMS EEI ≤ 0.23
	Germany	All sizes

Selection information

Minimum pressure

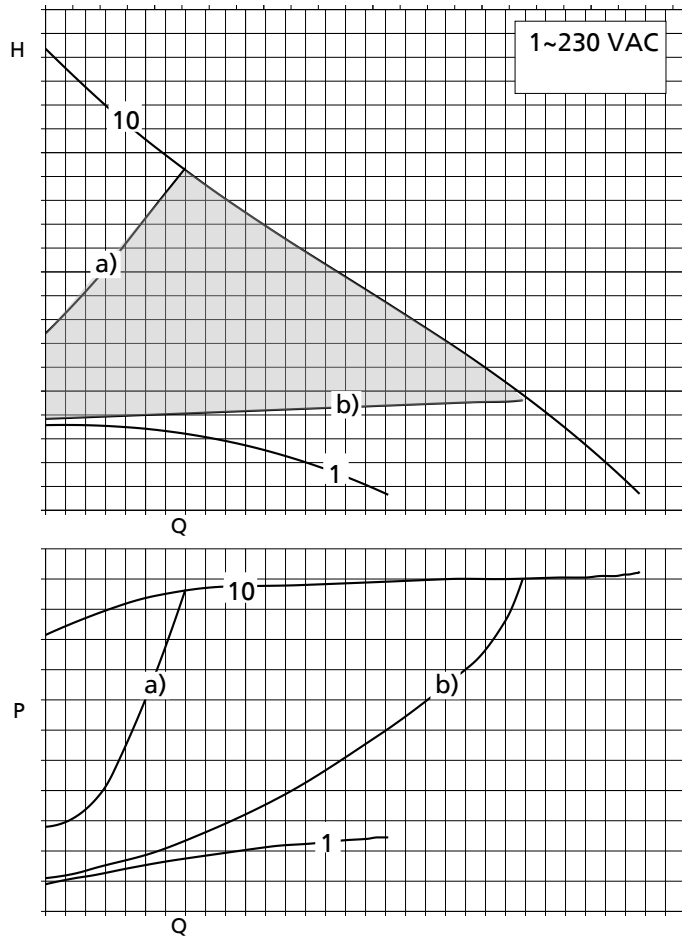
The minimum pressure p_{min} at the pump suction nozzle serves to avoid cavitation noises at an ambient temperature of +40 °C and the indicated fluid temperature T_{max} .

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 pressure p_{min} [bar] specified for the fluid temperature [°C]

Calio	Fluid temperature	Minimum pressure
	[°C]	[bar]
S	5 to 75	0,05
	76 to 95	0,28
S BMS	5 to 80	0,5
	81 to 95	1,5

Description of the characteristic curve



Selection example

1	Min.	Fixed speed operation
10	Max.	Fixed speed operation
	Control range, settings in 0.1 m increments	
a)	Control curve, maximum head	
b)	Control curve, minimum head	

i The characteristic curve can be adjusted between a) and b) by pressing the control keys.

Programme overview / selection tables

Features and functions

Features and functions

Functions	Feature	
	Calio S	Calio S BMS
Operating modes		
$\Delta p-v$ for variable differential pressure	X	X
$\Delta p-c$ for constant differential pressure	X	X
Fixed speed operation	X	X
Eco Mode	-	X
Manual functions		
Setting the operating mode	X	X
Setting the differential pressure setpoint	X	X
Setting of speed level	X	X

Functions	Feature	
	Calio S	Calio S BMS
Vent plug	X	-
Deblocking option	X	-
Automatic functions		
Continuous output adjustment depending on mode (Δp control)	X	X
Setback operation	X	X
Soft start	X	X
Integrated interfaces: 0 - 10 V DC, external start/stop, general fault (voltage-free relay contact)	-	X
Signalling and display functions		
Error codes shown on display	X	X
"System operational" message via additional module	-	-
Alternating display of flow rate and electrical input power	X	X

Technical data

Selection table Calio S

Calio S	Connection		PN	P ₁ [W]	Motor protection ²⁾	Signalling contacts ³⁾	Nominal current 1~230 VAC, 50/60 Hz [A]	Mat. No.	[kg]
	Piping	Pump							
15-40-130	R ½	G 1	10	4,0 - 23	X	-	0,05 - 0,23	29134760	2.5
15-60-130	R ½	G 1	10	4,0 - 47	X	-	0,05 - 0,48	29134761	2.5
25-40-130	R 1	G 1 ½	10	4,0 - 23	X	-	0,05 - 0,23	29134762	2.5
25-60-130	R 1	G 1 ½	10	4,0 - 47	X	-	0,05 - 0,48	29134763	2.5
25-40	R 1	G 1 ½	10	4,0 - 23	X	-	0,05 - 0,23	29134756	2.7
25-60	R 1	G 1 ½	10	4,0 - 47	X	-	0,05 - 0,48	29134757	2.7
30-40	R 1 ¼	G 2	10	4,0 - 23	X	-	0,05 - 0,23	29134758	2.7
30-60	R 1 ¼	G 2	10	4,0 - 47	X	-	0,05 - 0,48	29134759	2.7
25-60 BMS	R 1	G 1 ½	10	8,0 - 100	X	X	0,10 - 0,80	29134307	4.6
30-60 BMS	R 1 ¼	G 2	10	8,0 - 100	X	X	0,10 - 0,80	29134308	4.8

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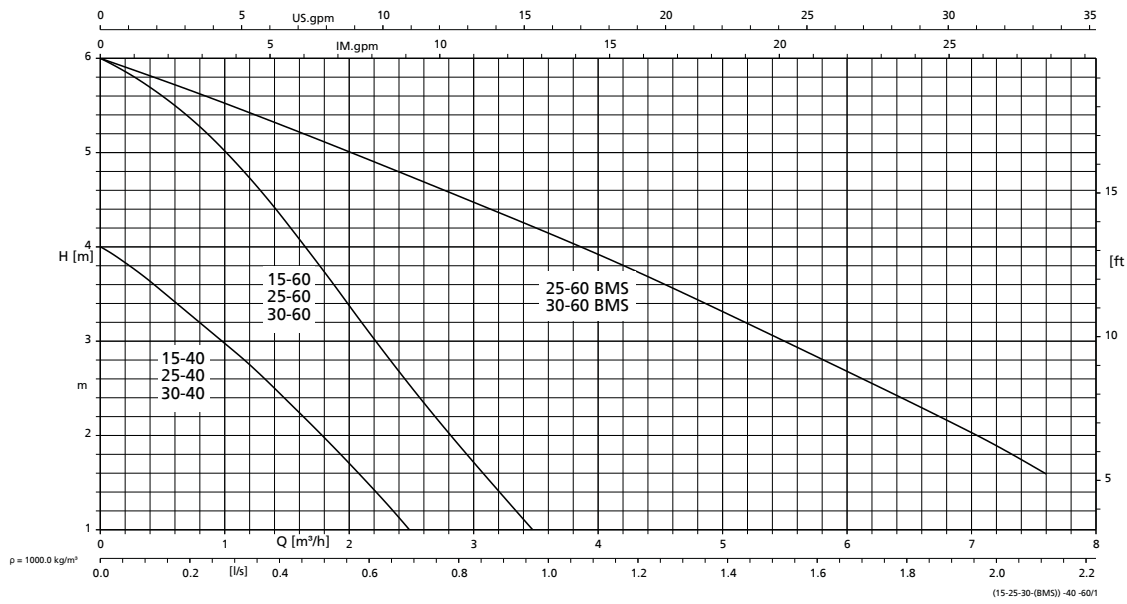
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²⁾ Integrated motor protection

³⁾ General fault message relay and terminal pairs for 0 - 10 V input and external start/stop

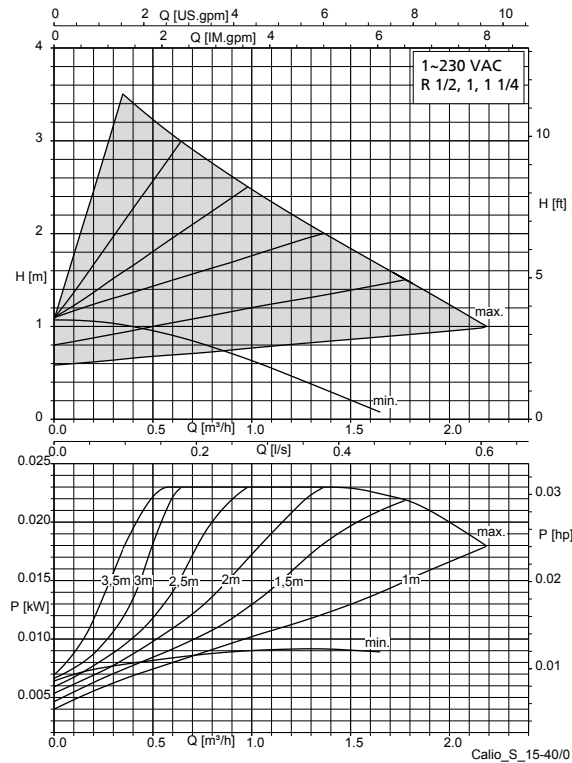
Selection chart

Calio S

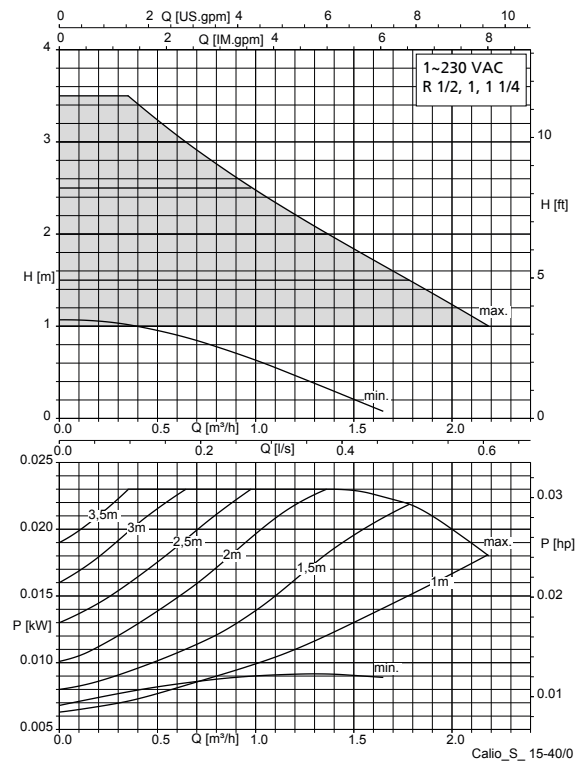


Characteristic curves

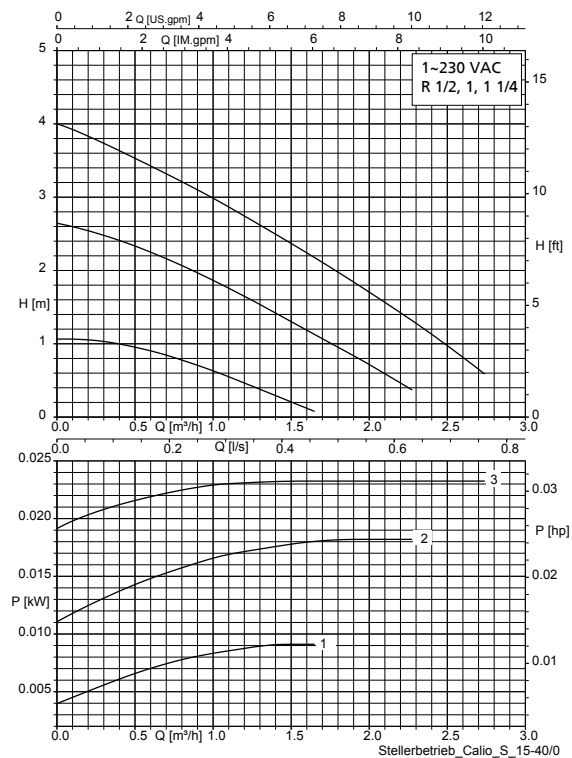
Calio S 15/25/30-40 Δpv



Calio S 15/25/30-40 Δpc

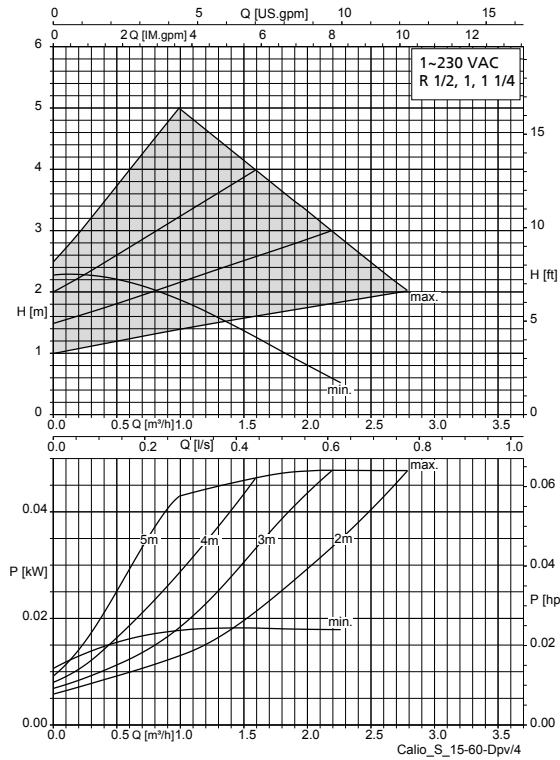


Calio S 15/25/30-40 fixed speed operation

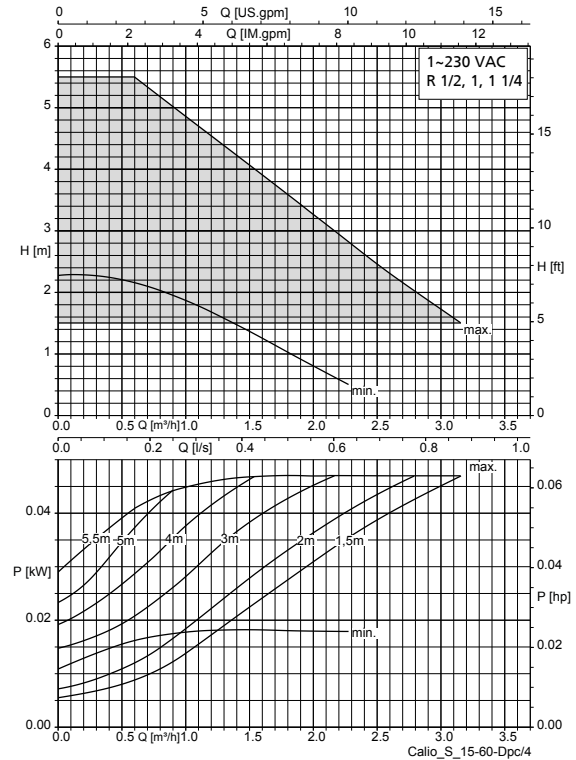


1, 2, 3 = speed level 1, 2, 3

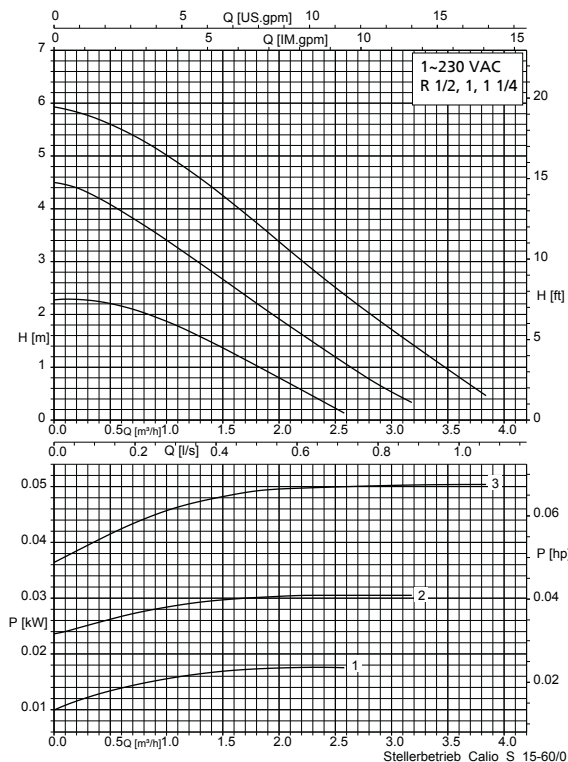
Calio S 15/25/30-60 Δpv



Calio S 15/25/30-60 Δpc

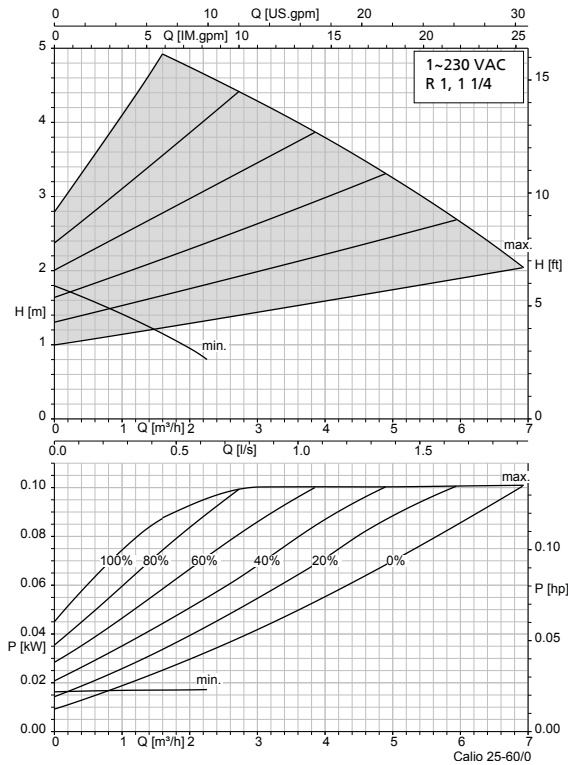


Calio S 15/25/30-60 fixed speed operation

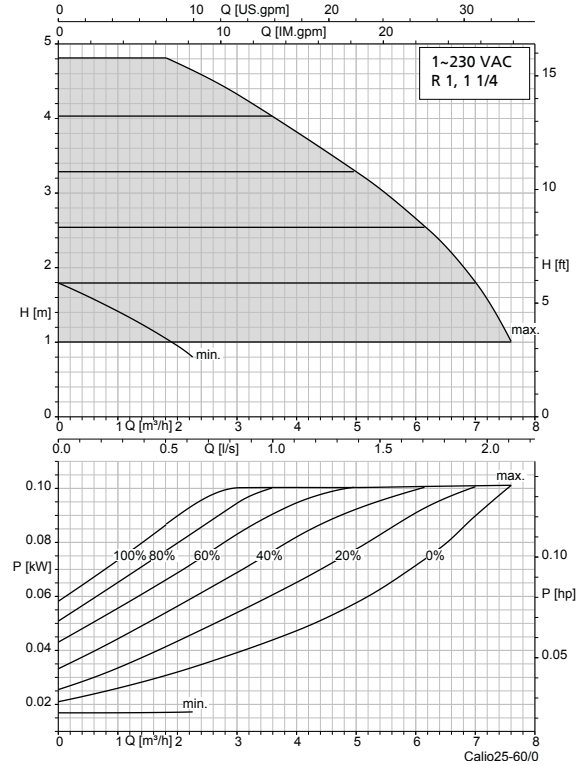


1, 2, 3 = speed level 1, 2, 3

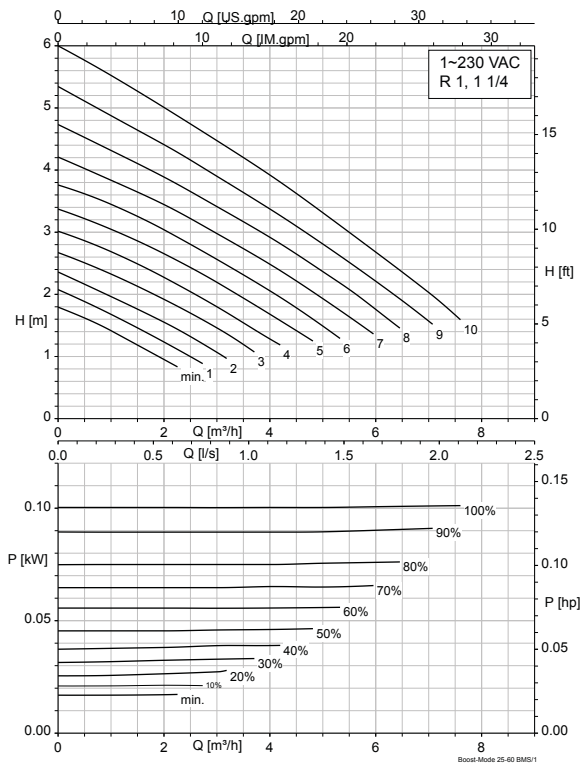
Calio S BMS 25/30-60 Δpv



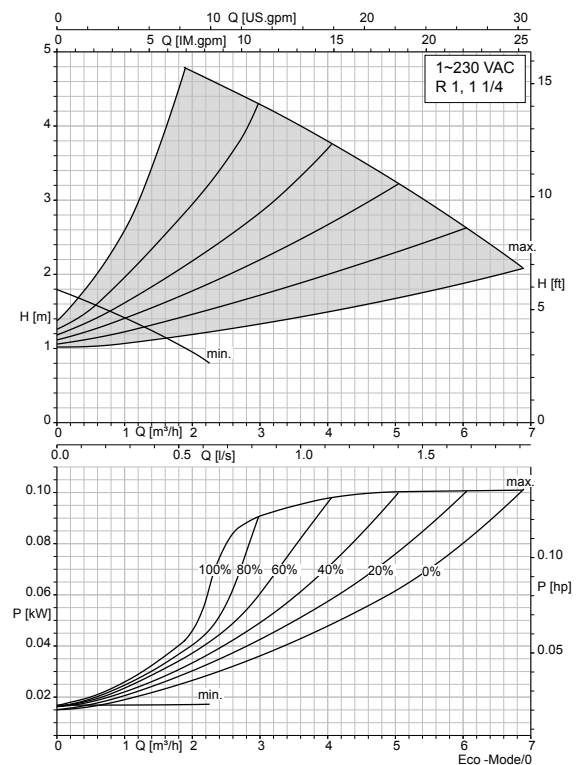
Calio S BMS 25/30-60 Δpc



Calio S BMS 25/30-60 fixed speed operation



Calio S BMS 25/30-60 Eco Mode



Total of 100 speed levels can be set between stage "min" and "10".

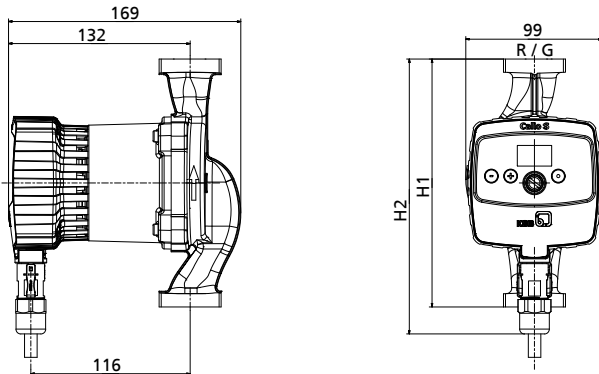
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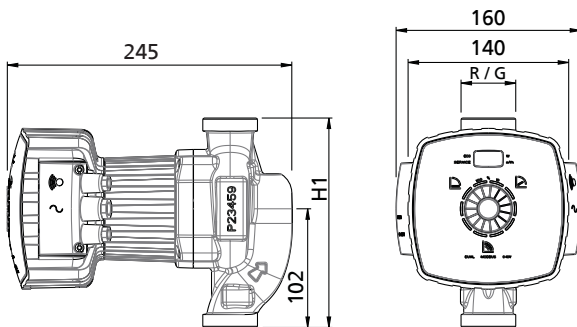
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Dimensions

Calio S



Calio S



Calio S BMS

Dimensions [mm]

Size	Rp	G	H1	H2
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
25-60 BMS	1	1 1/2	180	-
30-60 BMS	1 1/4	2	180	-

Installation information

Calio S

Permissible installation positions

Sizes	
All	

Scope of supply

- Pump
- Sealing elements
- Installation and operating manual
- Thermal insulation shells (for 180 mm overall length only)

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