High-efficiency Circulator Pump

Calio

Type Series Booklet

KSB

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Type Series Booklet Calio

Contents

Building Services: Heating

Variable-Speed Circulator Pumps

Calio

Main applications

Heating, ventilation, air-conditioning, cooling 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
  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
Flow rate	Q [m³/h]	Screw-ended pumps: ≤ 15
		Flanged pumps: ≤ 51
	Q [l/s]	Screw-ended pumps: ≤ 4.2
		Flanged pumps: ≤ 14.2
Head	H [m]	Screw-ended pumps: ≤ 12
		Flanged pumps: ≤ 18
Fluid temperature	T [°C]	-10 to +110
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		Screw-end: R 1, R 1 $^{1}/_{4}$
		Flange: DN 32 to DN 100

Designation

Example: Calio 25-100

Designation key

Code	Description
Calio	High-efficiency pump
25	Nominal diameter of pipe connection
	25 = R 1
	30 = R 1 $^{1}/_{4}$
	32 to 100 = DN 32 to DN 100
100	Head in m x 10 (example 100 = 10 m)

Design details

Design

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

Drive

- High-efficiency electric motor with continuously variable differential pressure control
- Electronically commutated synchronous motor with permanent magnet rotor
- 1~230 VAC, 50/60 Hz
- IP44 enclosure
- Thermal class F
- Temperature class TF 110
- Interference emissions EN 61 000-6-3
- Interference immunity EN 61 000-6-2

Bearings

- Product-lubricated special plain bearing

Connections

- Screw-ended or flanged

Operating modes

- Constant-pressure and proportional-pressure control
- Eco Mode with dynamic differential pressure setpoint adjustment
- Boost Mode with manual setpoint input

Automatic functions

- Continuous output adjustment depending on the operating mode
- 0 – 10 V with external differential pressure/speed setpoint
- Dual pump configuration
- Modbus
- Setback operation
- External start/stop
- Deblocking function
- Self-venting function
- Soft start
- Full motor protection with integrated trip electronics

Manual functions

- Setting the operating mode
- Setting the differential pressure setpoint
- Setting the speed level
- Locking the control panel

Signalling and display functions

- Error codes indicated on the display
- General fault message

Pump 40-120/-180, 50-100/-120/-150/-180, 65-120, DN 80, DN 100:

- Alternating display of flow rate, electrical input power, and head
- Integrated "system operational" message

Pump DN 25, DN 30, DN 32, 40-60/-70/-80/-90/-100, 50-40/-60/-80/-90, 65-60:

- "System operational" message via additional module

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 glass fibre content (PSU-GF30)
Bearing	Ceramics/carbon
Can	Stainless steel 1.4301
Thermal insulation shells	Polypropylene

Product benefits

- Maximum savings of operating costs by high-efficiency technology combined with variable 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	Effective in:	Comment
ErP 2015+	Europe	EEI ≤ 0.23
HAND WERKER MARKE MEISTERKLASSE Von Profis. Für Qualität.	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 °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.

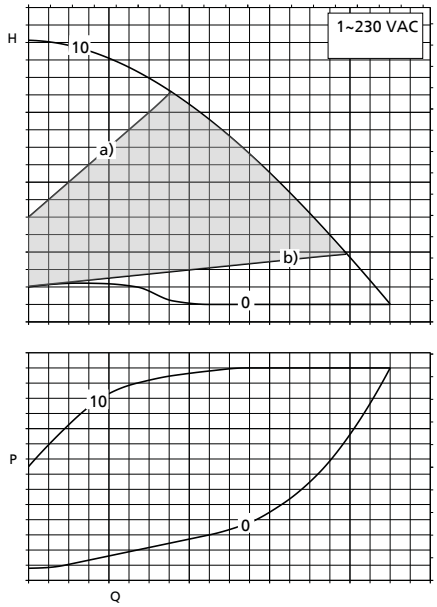
Minimum pressure p_{min} [bar] specified for the fluid temperature [°C]

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

Fluid temperature [°C] specified for the ambient temperature [°C]

Size	Fluid temperature	Ambient temperature
	[°C]	[°C]
All	110	30
	90	40

Description of the characteristic curve

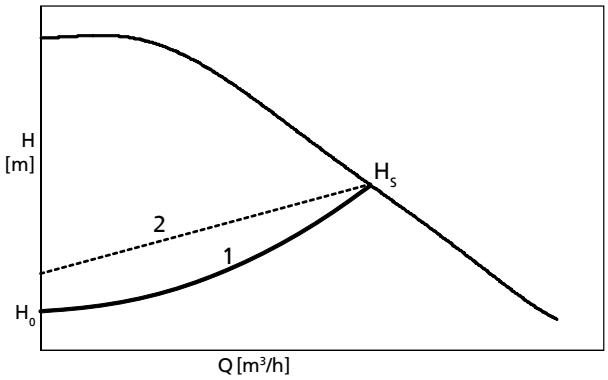


Selection example

0	Level 0	Open-loop control, minimum speed (corresponds to a setting of 0 %)
10	Level 10	Open-loop control, maximum speed (corresponds to a setting of 100 %)
	Control range, settings in increments of 1 %	
a)	Control curve, maximum head	
b)	Control curve, minimum head	
The characteristic curve can be adjusted between a) and b) by turning the press&turn 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 x 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 operating manual of the pump.

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	Feature
Operating modes	
Δp-v for variable differential pressure	✗
Δp-c for constant differential pressure	✗
Eco Mode with dynamic differential pressure setpoint adjustment	✗
Boost Mode	✗
Manual functions	
Setting the operating mode	✗
Setting the differential pressure setpoint	✗
Setting of speed level	✗
Automatic functions	
Continuous output adjustment depending on the mode of operation (Δp control)	✗
Setback operation	✗
Deblocking function (start-up at max. torque)	✗
Soft start	✗
Interfaces for all-in concept	
Integrated "system operational" message	See signalling and display functions
Integrated 0 - 10 V interface for differential pressure/speed setpoint	✗
Serial digital Modbus RTU interface for connection to a building management system via RS485 bus system	✗
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)	✗
Integrated start/stop interface (terminal pair RUN)	✗
Integrated general fault message relay (volt-free changeover contact)	✗
Signalling and display functions	
"System operational" message via additional module (Calio DN 25/30/32, 40-60/70/80/90/100, 50-40/60/80/90, 65-60)	✗
Integrated volt-free "system operational" message relay (Calio 40-120/180, Calio 50-100/120/150/180, Calio 65-120, Calio DN 80, Calio DN 100)	✗
Alternating display of flow rate and electrical input power	✗
Operating mode displayed by symbols	✗
Error codes indicated on the display	✗

Technical data

Calio selection table

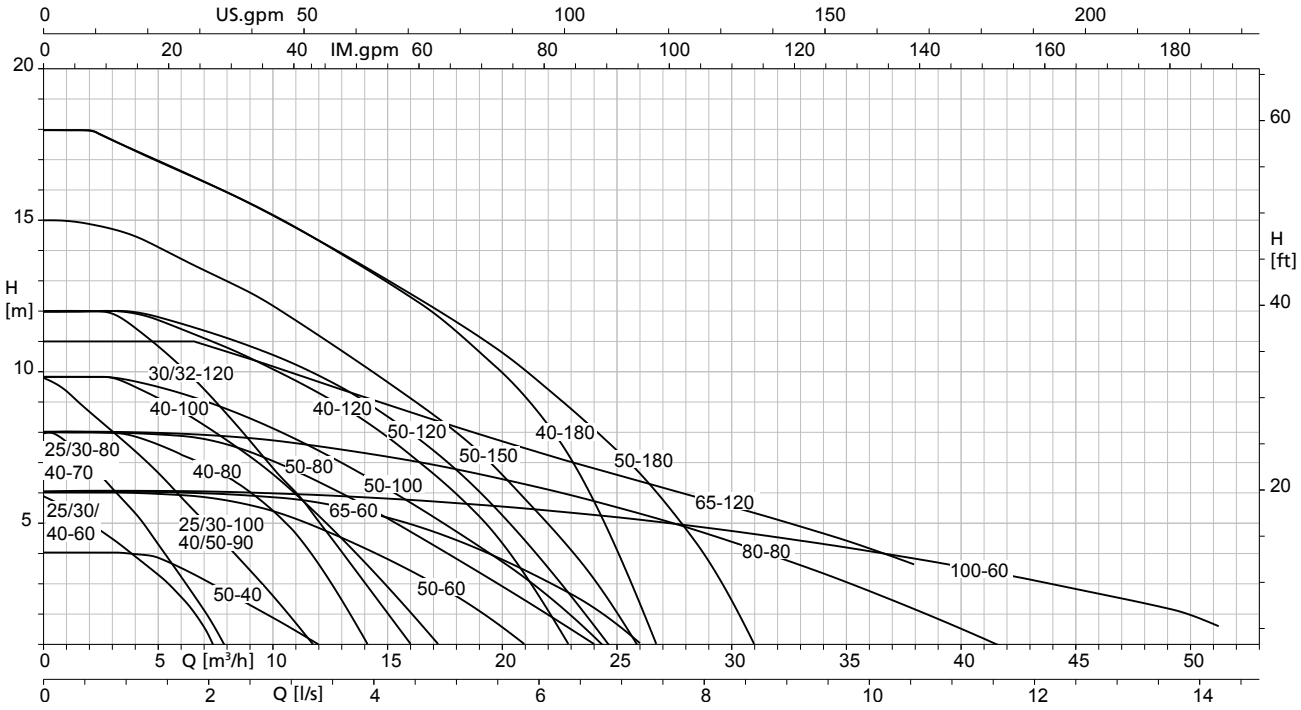
Calio	Connection		PN	n		P_1	Motor protection [1]	Signalling contacts [2][3][4][5]	Nominal current	Mat. No.	[kg]
	Piping	Pump	[bar]	min. [rpm]	max. [rpm]	[W]			1~230 VAC, 50/60 Hz [A]		
25-60	R 1	G 1 ½	10	1000	3370	6 - 112	✘	1, 3	0,03 - 0,50	29134276	4.6
25-60	R 1	G 1 ½	16	1000	3370	6 - 112	✘	1, 3	0,03 - 0,50	29134478	4.7
25-80	R 1	G 1 ½	10	1000	3970	6 - 145	✘	1, 3	0,03 - 0,63	29134277	4.6
25-80	R 1	G 1 ½	16	1000	3970	6 - 145	✘	1, 3	0,03 - 0,63	29134479	4.7
25-100	R 1	G 1 ½	10	1000	4500	6 - 175	✘	1, 3	0,03 - 0,80	29134278	4.6
25-100	R 1	G 1 ½	16	1000	4500	6 - 175	✘	1, 3	0,03 - 0,80	29134480	4.7
30-60	R 1 ¼	G 2	10	1000	3370	6 - 112	✘	1, 3	0,03 - 0,50	29134279	4.8
30-60	R 1 ¼	G 2	16	1000	3370	6 - 112	✘	1, 3	0,03 - 0,50	29134481	4.9
30-80	R 1 ¼	G 2	10	1000	3970	6 - 145	✘	1, 3	0,03 - 0,63	29134280	4.8
30-80	R 1 ¼	G 2	16	1000	3970	6 - 145	✘	1, 3	0,03 - 0,63	29134482	4.9
30-100	R 1 ¼	G 2	10	1000	4500	6 - 175	✘	1, 3	0,03 - 0,80	29134281	4.8
30-100	R 1 ¼	G 2	16	1000	4500	6 - 175	✘	1, 3	0,03 - 0,80	29134483	4.9
30-120	R 1 ¼	G 2	10	1000	3970	9 - 350	✘	1, 3	0,04 - 1,50	29134282	6.4
30-120	R 1 ¼	G 2	16	1000	3970	9 - 350	✘	1, 3	0,04 - 1,50	29134484	6.5
32-120	DN 32	DN 32	6/10	1000	3970	9 - 350	✘	1, 3	0,04 - 1,50	29134283	9.3
32-120	DN 32	DN 32	16	1000	3970	9 - 350	✘	1, 3	0,04 - 1,50	29134485	9.4
40-60	DN 40	DN 40	6/10	1000	3650	7 - 110	✘	1, 3	0,03 - 0,48	29134284	8
40-60	DN 40	DN 40	16	1000	3650	7 - 110	✘	1, 3	0,03 - 0,48	29134486	8.2
40-70	DN 40	DN 40	6/10	1000	3900	7 - 138	✘	1, 3	0,03 - 0,60	29134309	8
40-70	DN 40	DN 40	16	1000	3900	7 - 138	✘	1, 3	0,03 - 0,60	29134329	8.2
40-80	DN 40	DN 40	6/10	1000	3650	10 - 265	✘	1, 3	0,04 - 1,15	29134310	11.1
40-80	DN 40	DN 40	16	1000	3650	10 - 265	✘	1, 3	0,04 - 1,15	29134330	11.2
40-90	DN 40	DN 40	6/10	1000	4500	7 - 175	✘	1, 3	0,03 - 0,80	29134311	8
40-90	DN 40	DN 40	16	1000	4500	7 - 175	✘	1, 3	0,03 - 0,80	29134331	8.2
40-100	DN 40	DN 40	6/10	1000	4050	10 - 350	✘	1, 3	0,04 - 1,50	29134312	11.1
40-100	DN 40	DN 40	16	1000	4050	10 - 350	✘	1, 3	0,04 - 1,50	29134332	11.2
40-120	DN 40	DN 40	6/10	1000	2900	46 - 611	✘	2, 3	0,20 - 2,70	29134313	20.3
40-120	DN 40	DN 40	16	1000	2900	46 - 611	✘	2, 3	0,20 - 2,70	29134333	20.5
40-180	DN 40	DN 40	6/10	1000	3500	46 - 756	✘	2, 3	0,20 - 3,30	29134314	20.3
40-180	DN 40	DN 40	16	1000	3500	46 - 756	✘	2, 3	0,20 - 3,30	29134334	20.5
50-40	DN 50	DN 50	6/10	1000	3130	7 - 133	✘	1, 3	0,03 - 0,58	29134289	9
50-40	DN 50	DN 50	16	1000	3130	7 - 133	✘	1, 3	0,03 - 0,58	29134491	9.2
50-60	DN 50	DN 50	6/10	1000	3290	10 - 275	✘	1, 3	0,04 - 1,20	29134316	12.6
50-60	DN 50	DN 50	16	1000	3290	10 - 275	✘	1, 3	0,04 - 1,20	29134336	12.7
50-80	DN 50	DN 50	6/10	1000	3650	10 - 350	✘	1, 3	0,04 - 1,50	29134317	12.6
50-80	DN 50	DN 50	16	1000	3650	10 - 350	✘	1, 3	0,04 - 1,50	29134337	12.7
50-90	DN 50	DN 50	6/10	1000	4500	7 - 168	✘	1, 3	0,03 - 0,73	29134318	9
50-90	DN 50	DN 50	16	1000	4500	7 - 168	✘	1, 3	0,03 - 0,73	29134338	9.2
50-100	DN 50	DN 50	6/10	1000	2750	38 - 476	✘	2, 3	0,16 - 2,10	29134714	21
50-100	DN 50	DN 50	16	1000	2750	38 - 476	✘	2, 3	0,16 - 2,10	29134715	21.6
50-120	DN 50	DN 50	6/10	1000	2930	46 - 620	✘	2, 3	0,20 - 2,70	29134346	21
50-120	DN 50	DN 50	16	1000	2930	46 - 620	✘	2, 3	0,20 - 2,70	29134347	21.6
50-150	DN 50	DN 50	6/10	1000	3260	46 - 680	✘	2, 3	0,20 - 3,00	29134319	21
50-150	DN 50	DN 50	16	1000	3260	46 - 680	✘	2, 3	0,20 - 3,00	29134339	21.6
50-180	DN 50	DN 50	6/10	1000	3600	46 - 745	✘	2, 3	0,20 - 3,20	29134320	21
50-180	DN 50	DN 50	16	1000	3600	46 - 745	✘	2, 3	0,20 - 3,20	29134340	21.6
65-60	DN 65	DN 65	6/10	1000	3160	15 - 350	✘	1, 3	0,07 - 1,50	29134294	16.6

1) Integrated motor protection in the terminal box
2) General fault message; optional "system operational" message in addition
3) 1 = "system operational" message by optional "system operational" signalling module (see accessories)
4) 2 = "system operational" message relay integrated
5) 3 = general fault message relay integrated

Calio	Connection		PN	n		P_1	Motor protection [1]	Signalling contacts [2][3][4][5]	Nominal current	Mat. No.	[kg]
	Piping	Pump	[bar]	min. [rpm]	max. [rpm]	[W]			1~230 VAC, 50/60 Hz [A]		
65-60	DN 65	DN 65	16	1000	3160	15 - 350	✘	1, 3	0,07 - 1,50	29134496	16.7
65-120	DN 65	DN 65	6/10	1000	3220	55 - 760	✘	2, 3	0,24 - 3,30	29134321	31.2
65-120	DN 65	DN 65	16	1000	3220	55 - 760	✘	2, 3	0,24 - 3,30	29134341	31.4
80-80	DN 80	DN 80	6	1000	2420	56 - 665	✘	2, 3	0,25 - 2,90	29134297	32.2
80-80	DN 80	DN 80	10	1000	2420	56 - 665	✘	2, 3	0,25 - 2,90	29134298	32.2
80-80	DN 80	DN 80	16	1000	2420	56 - 665	✘	2, 3	0,25 - 2,90	29134499	32.4
100-60	DN 100	DN 100	6	1000	2100	76 - 737	✘	2, 3	0,33 - 3,20	29134323	41.2
100-60	DN 100	DN 100	10	1000	2100	76 - 737	✘	2, 3	0,33 - 3,20	29134324	41.2
100-60	DN 100	DN 100	16	1000	2100	76 - 737	✘	2, 3	0,33 - 3,20	29134343	41.4

Selection chart

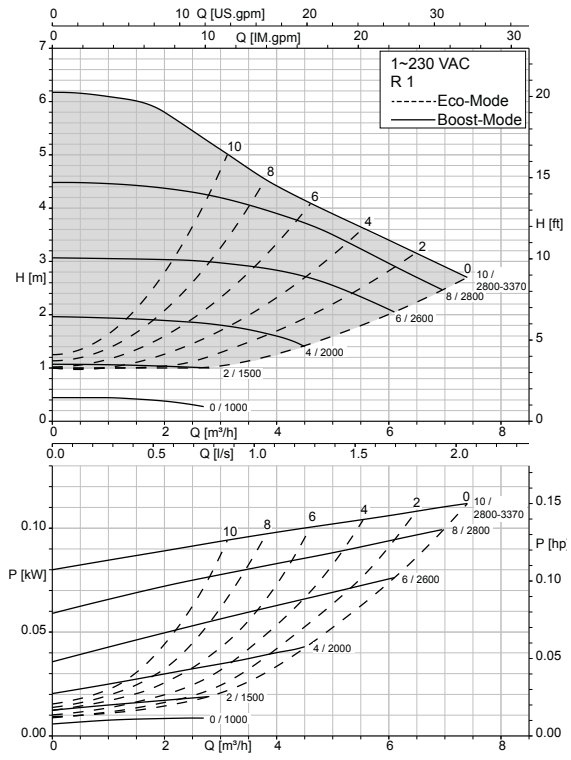
Calio



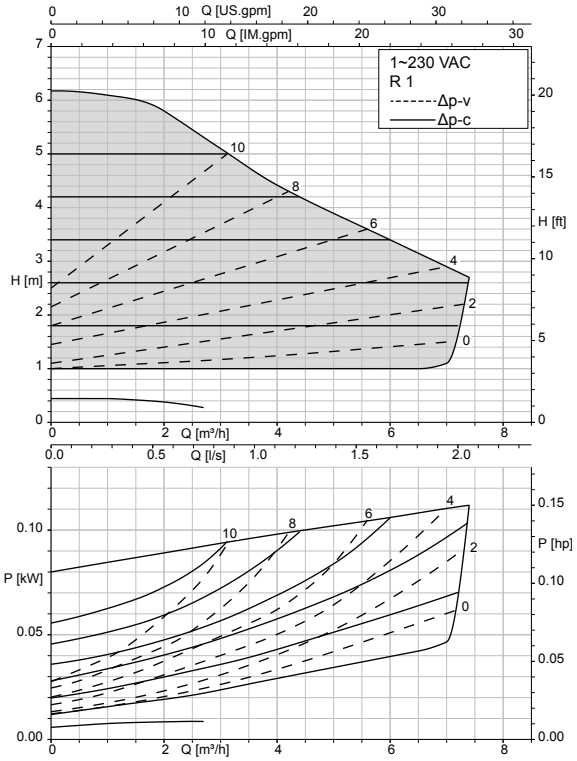
1) Integrated motor protection in the terminal box
2) General fault message; optional "system operational" message in addition
3) 1 = "system operational" message by optional "system operational" signalling module (see accessories)
4) 2 = "system operational" message relay integrated
5) 3 = general fault message relay integrated

Characteristic curves

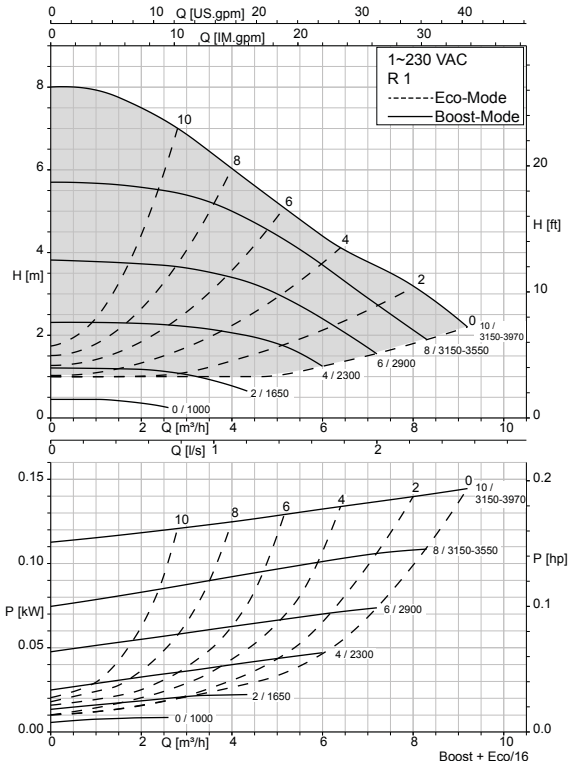
Calio 25-60 Boost, Eco Mode



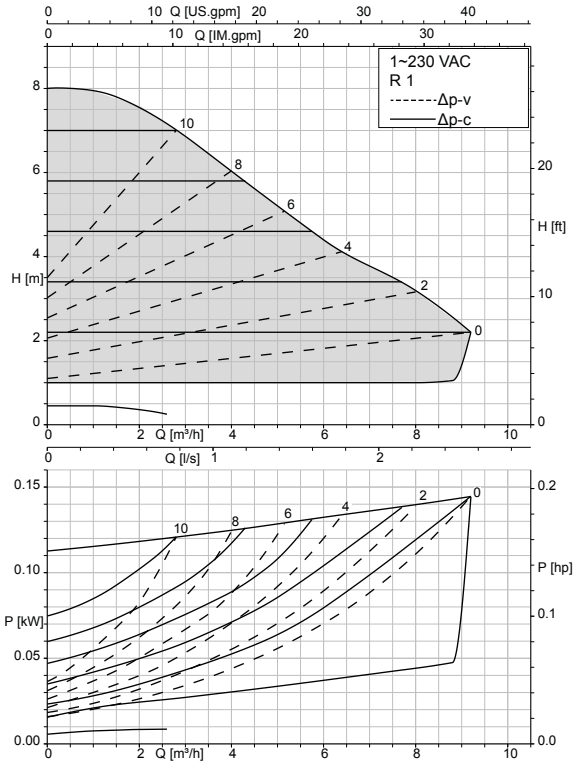
Calio 25-60 Δpv, Δpc



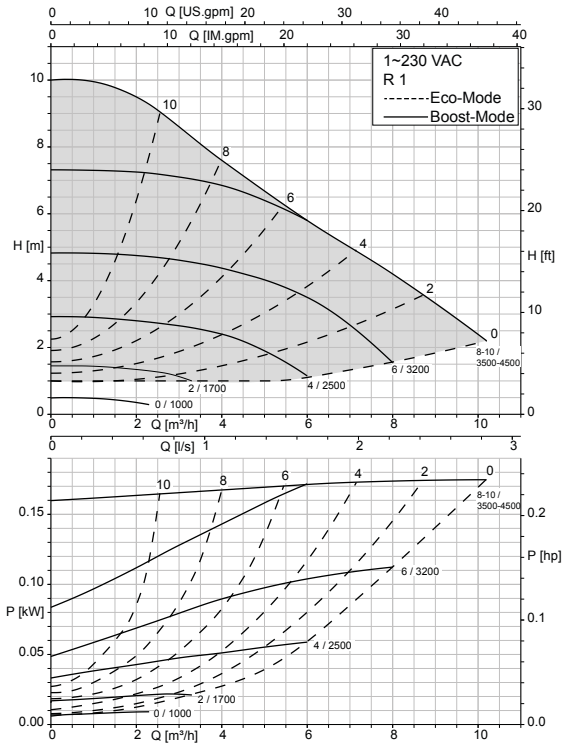
Calio 25-80 Boost, Eco Mode



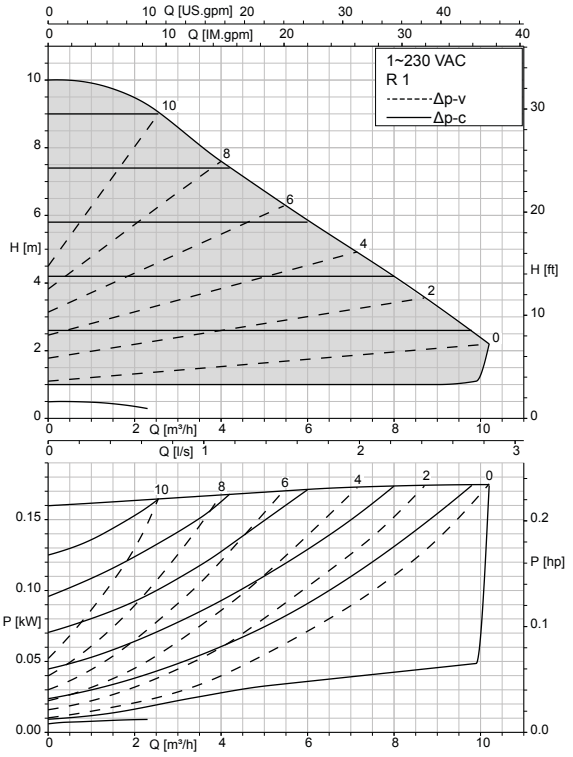
Calio 25-80 Δpv, Δpc



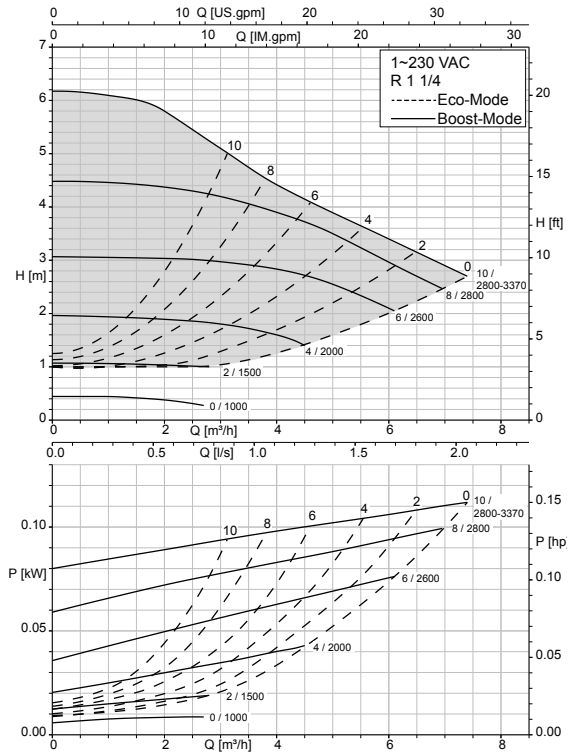
Calio 25-100 Boost, Eco Mode



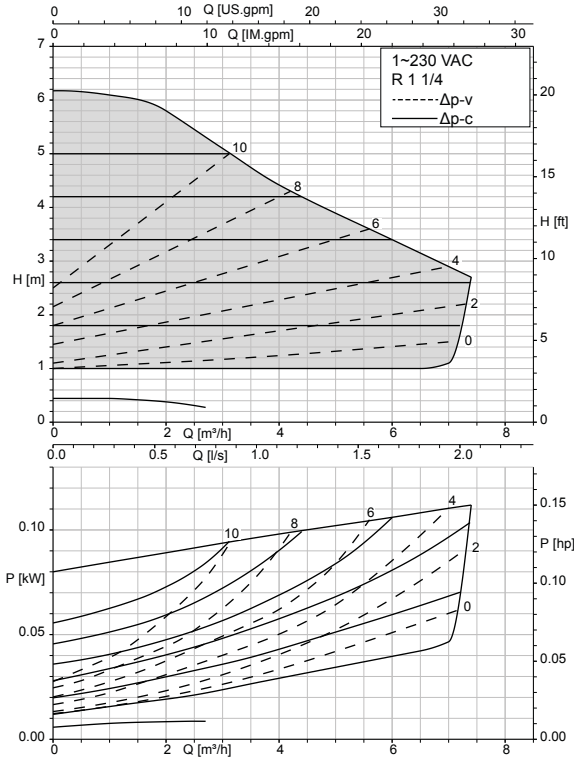
Calio 25-100 Δpv, Δpc



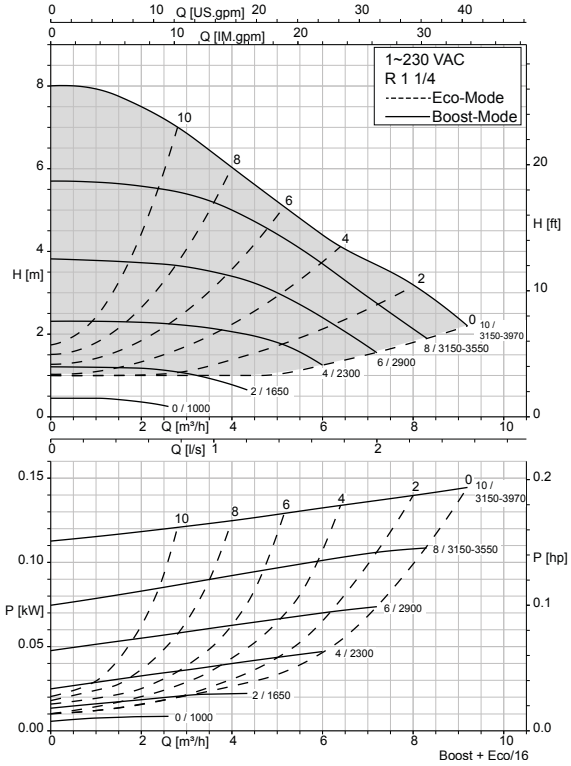
Calio 30-60 Boost, Eco Mode



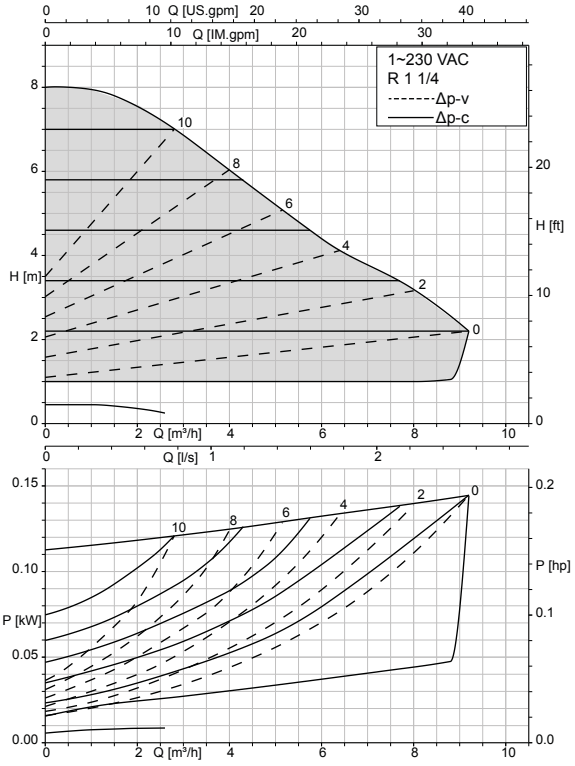
Calio 30-60 Δpv, Δpc



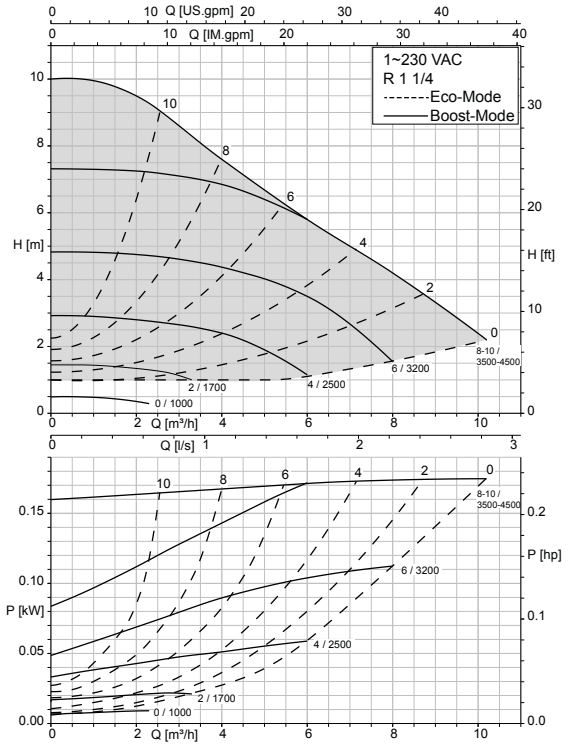
Calio 30-80 Boost, Eco Mode



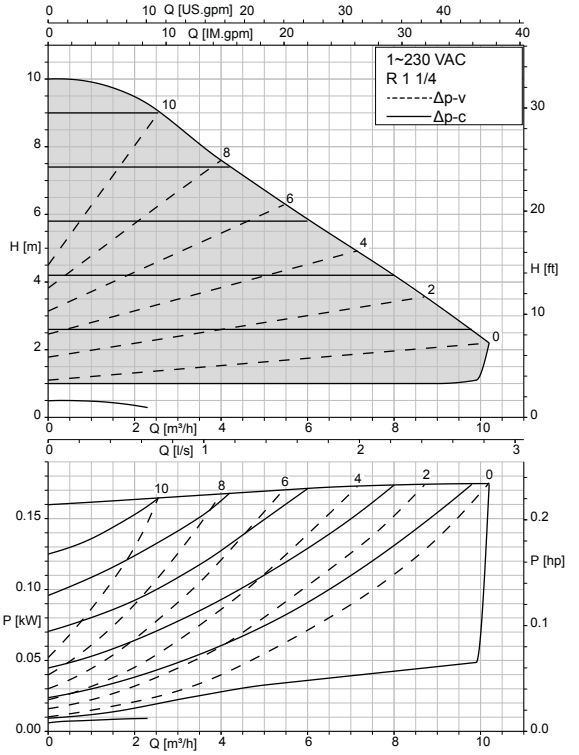
Calio 30-80 Δpv, Δpc



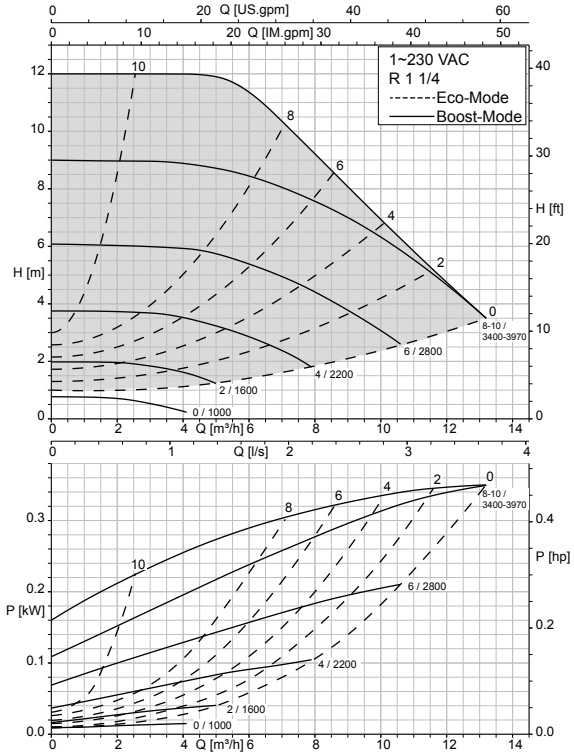
Calio 30-100 Boost, Eco Mode



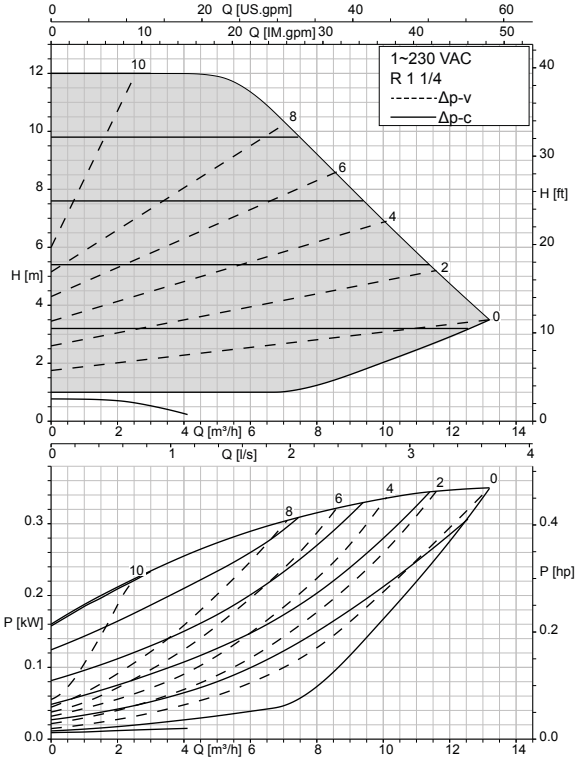
Calio 30-100 Δpv, Δpc



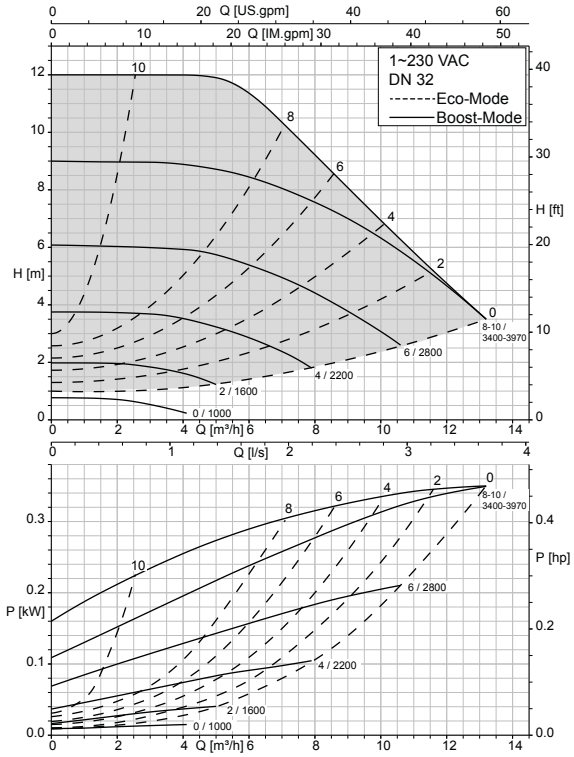
Calio 30-120 Boost, Eco Mode



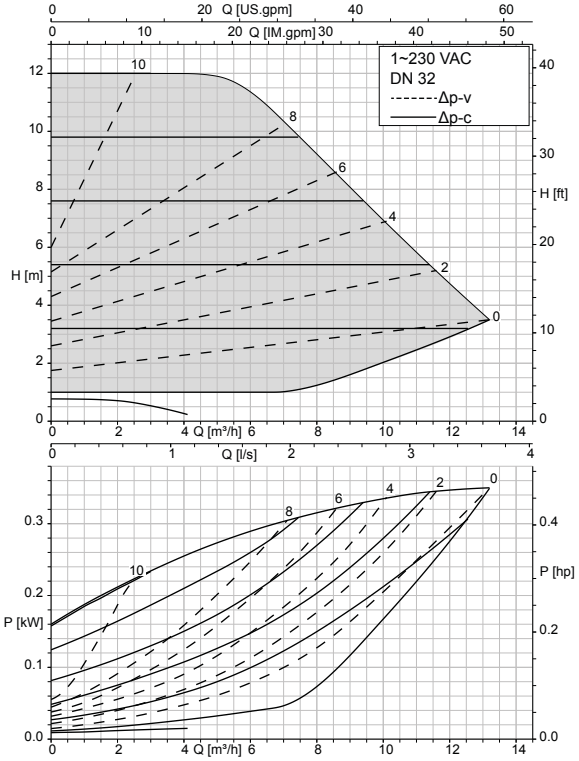
Calio 30-120 Δpv, Δpc



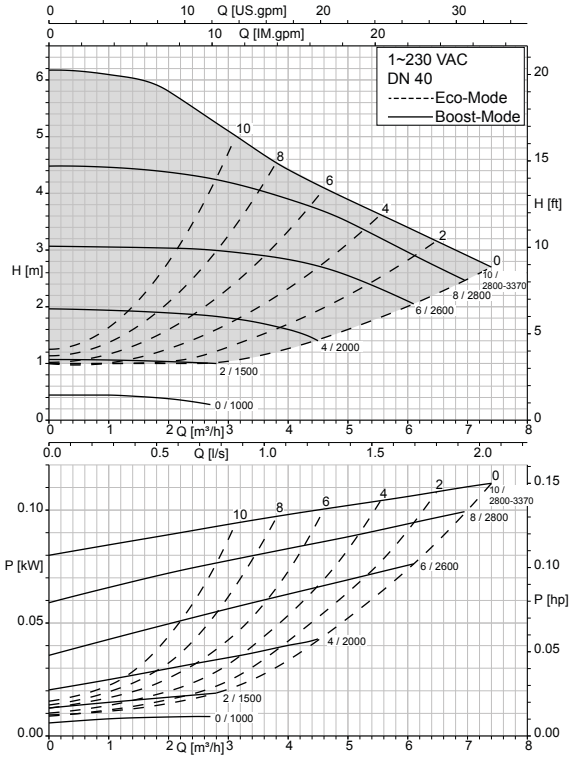
Calio 32-120 Boost, Eco Mode



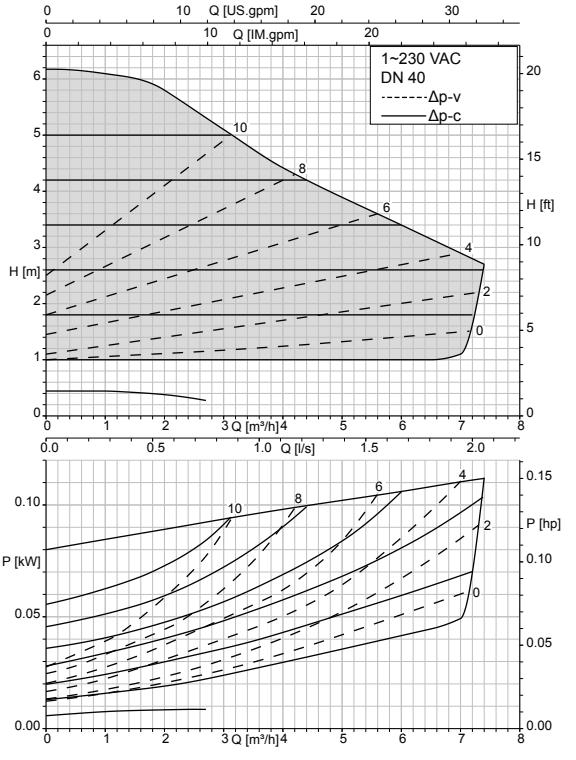
Calio 32-120 Δpv, Δpc



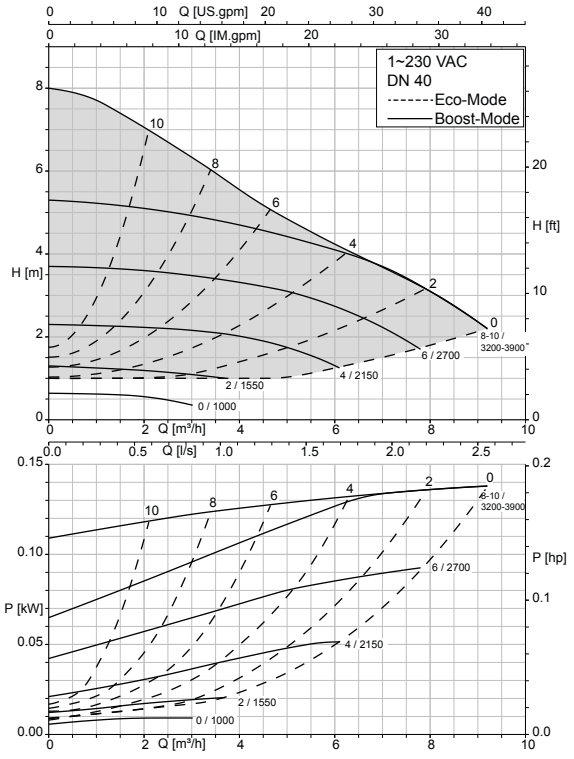
Calio 40-60 Boost, Eco Mode



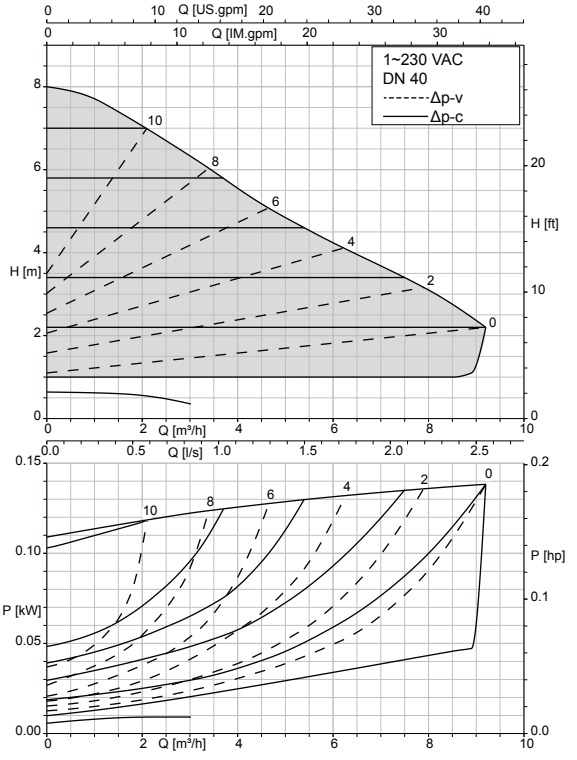
Calio 40-60 Δpv, Δpc



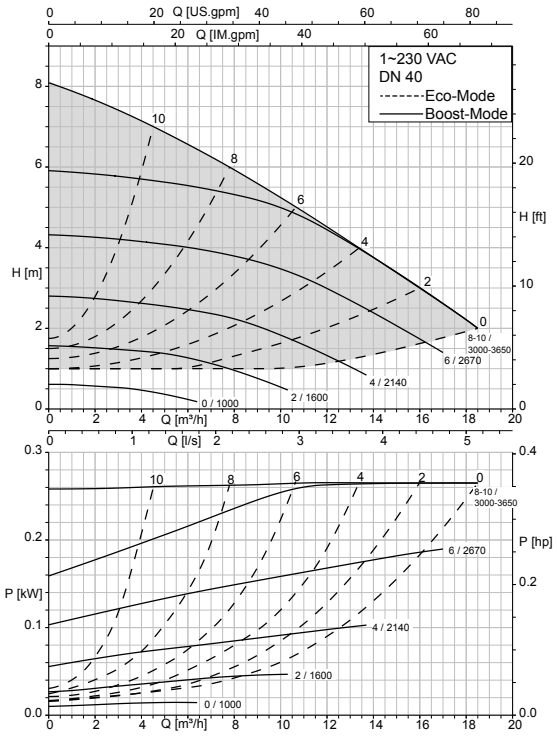
Calio 40-70 Boost, Eco Mode



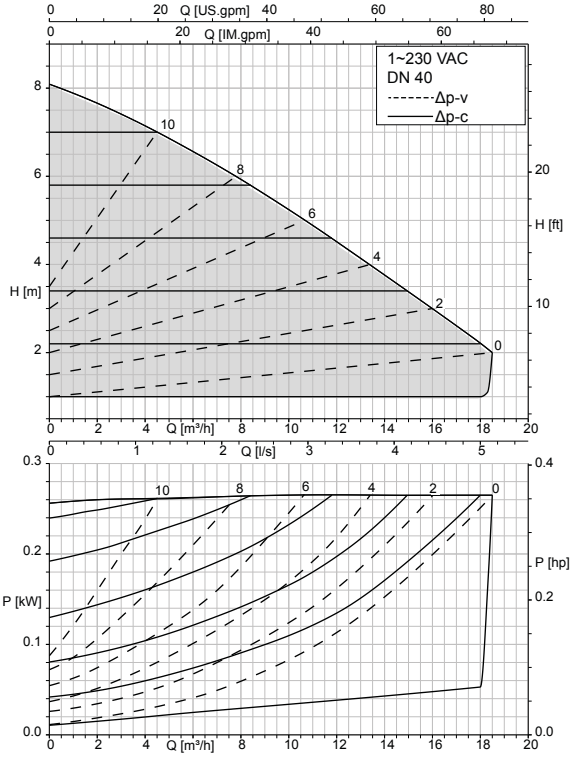
Calio 40-70 Δpv, Δpc



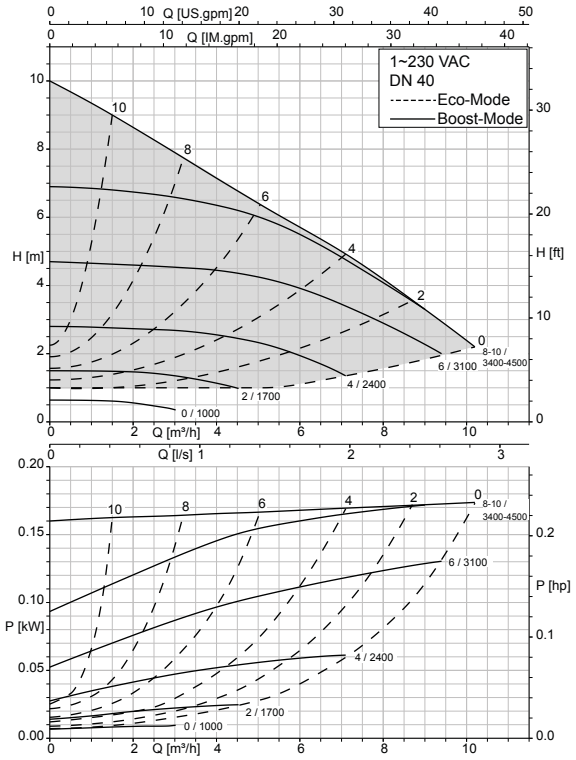
Calio 40-80 Boost, Eco Mode



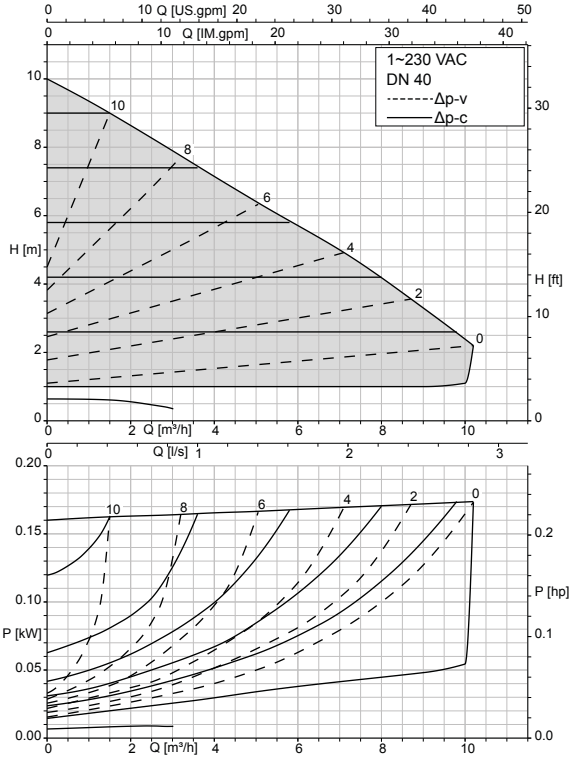
Calio 40-80 Δpv, Δpc



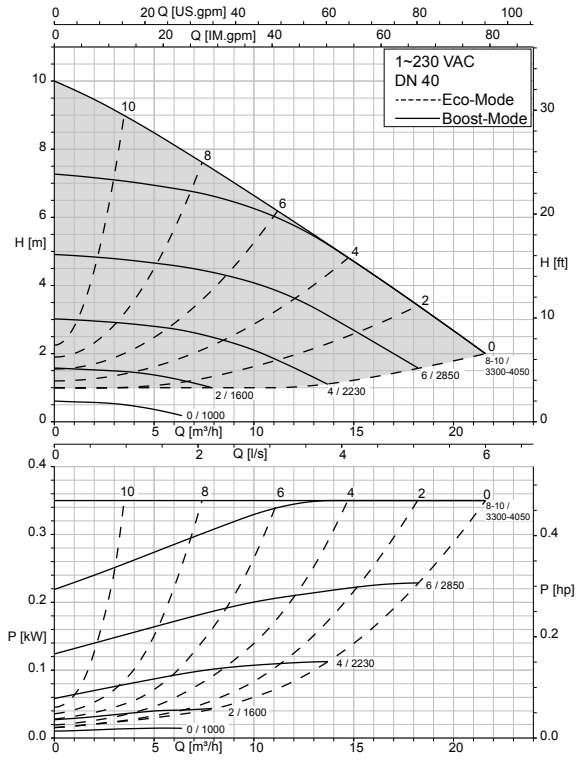
Calio 40-90 Boost, Eco Mode



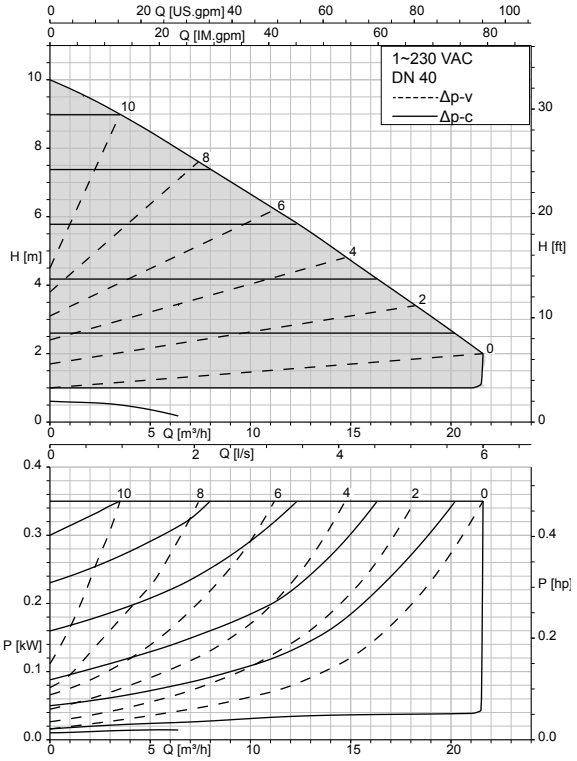
Calio 40-90 Δpv, Δpc



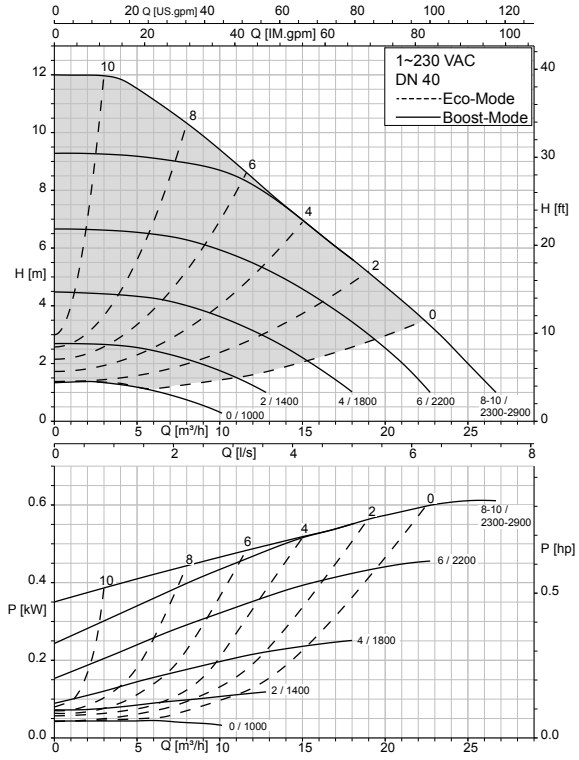
Calio 40-100 Boost, Eco Mode



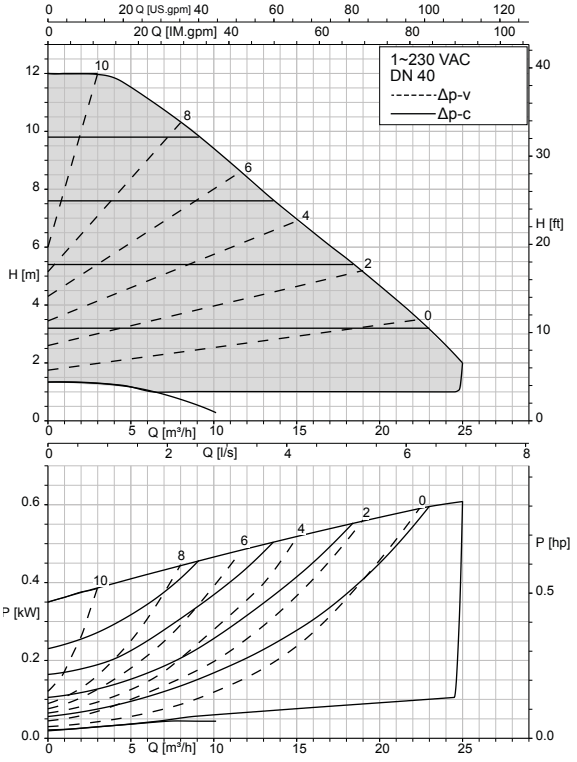
Calio 40-100 Δpv, Δpc



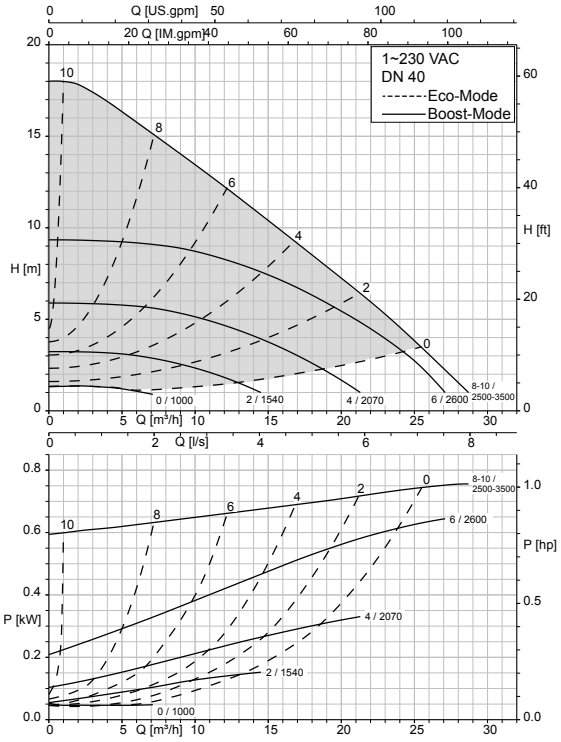
Calio 40-120 Boost, Eco Mode



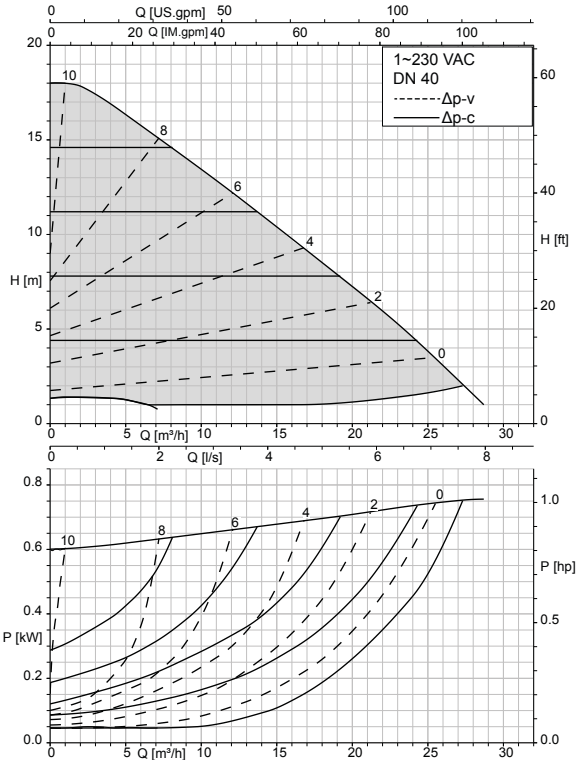
Calio 40-120 Δpv, Δpc



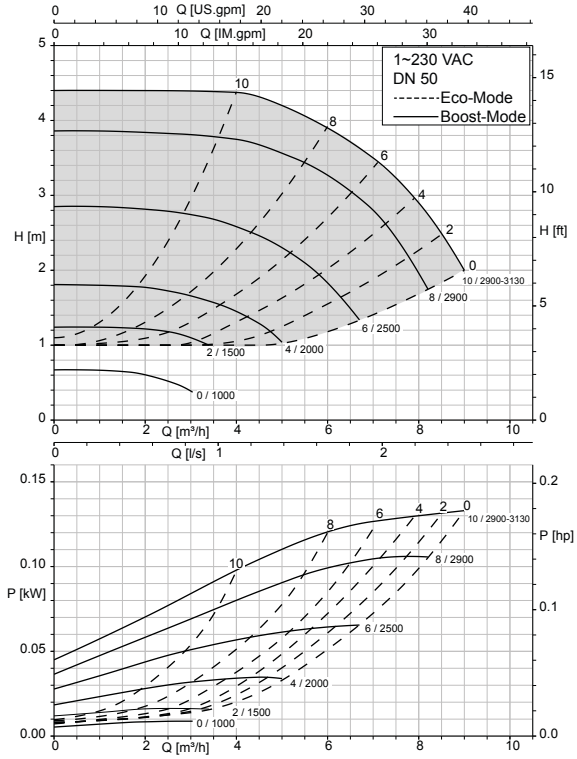
Calio 40-180 Boost, Eco Mode



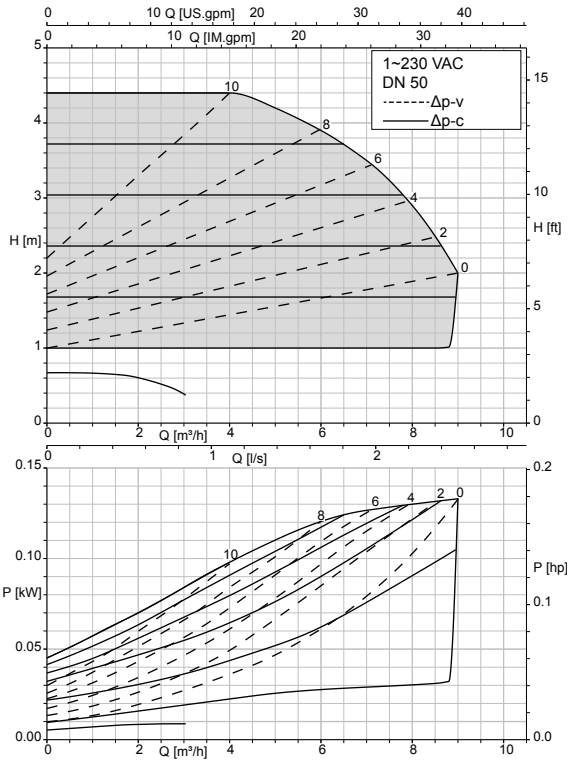
Calio 40-180 Δpv, Δpc



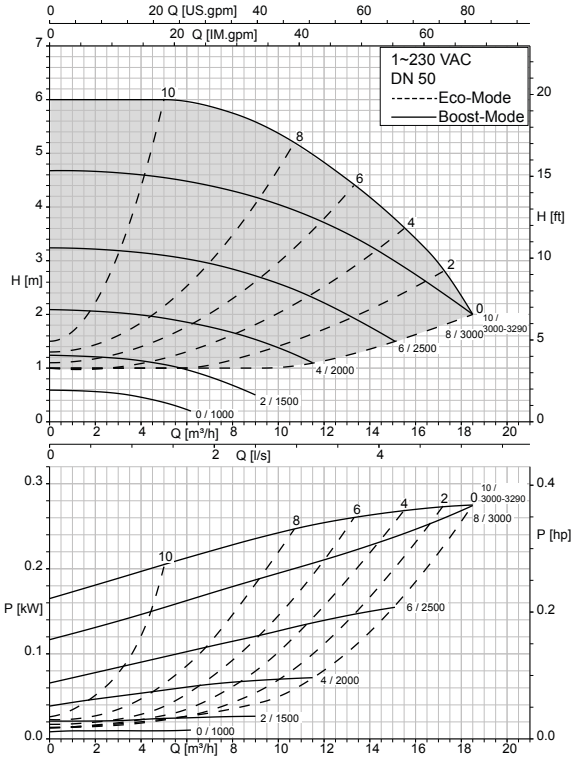
Calio 50-40 Boost, Eco Mode



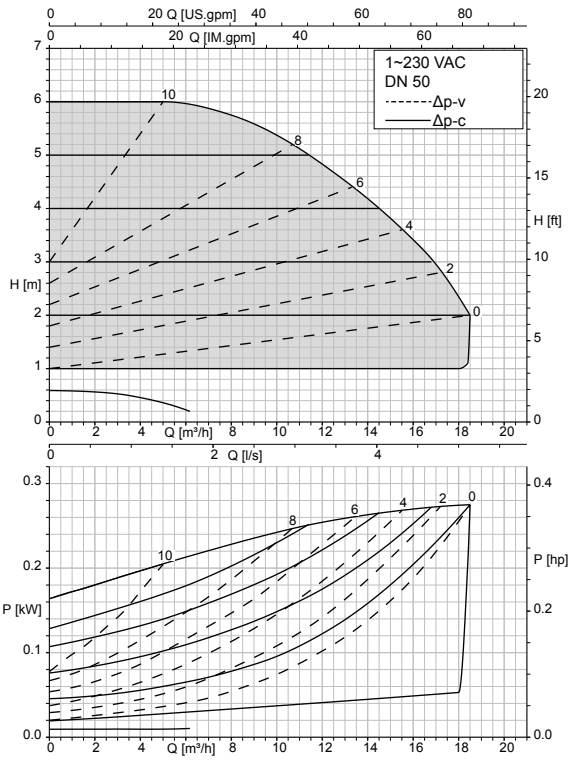
Calio 50-40 Δpv, Δpc



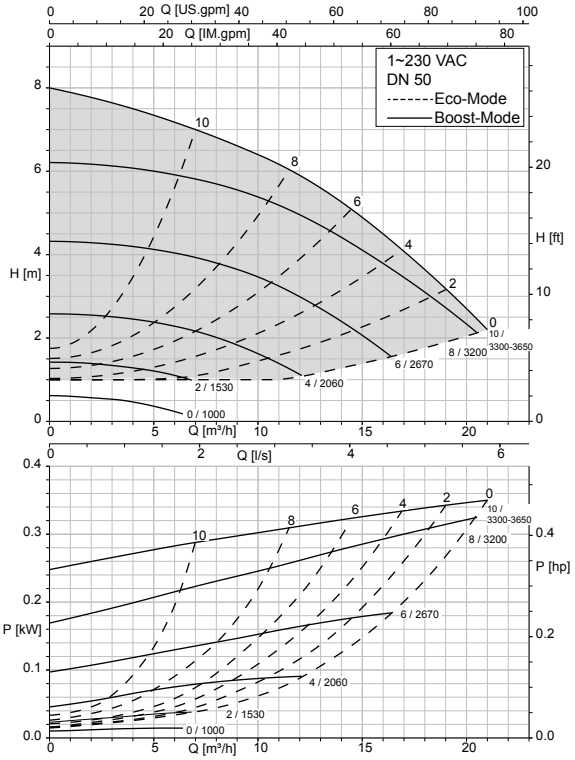
Calio 50-60 Boost, Eco Mode



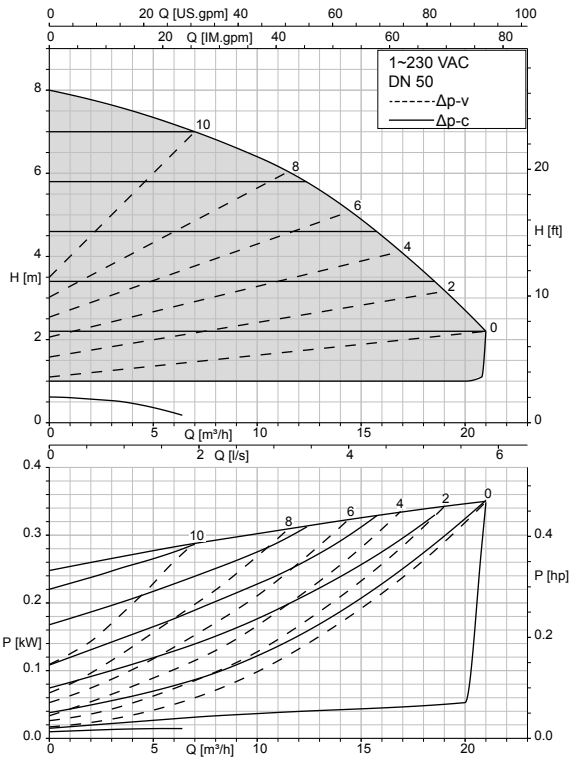
Calio 50-60 Δpv, Δpc



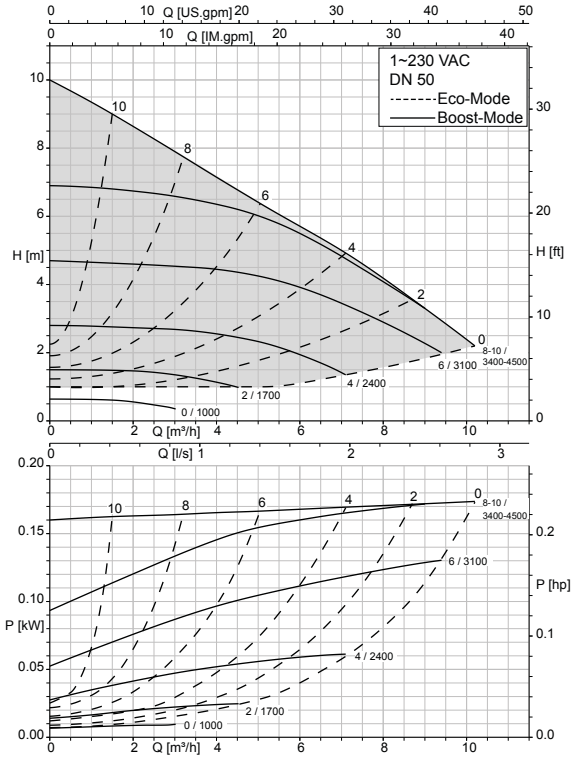
Calio 50-80 Boost, Eco Mode



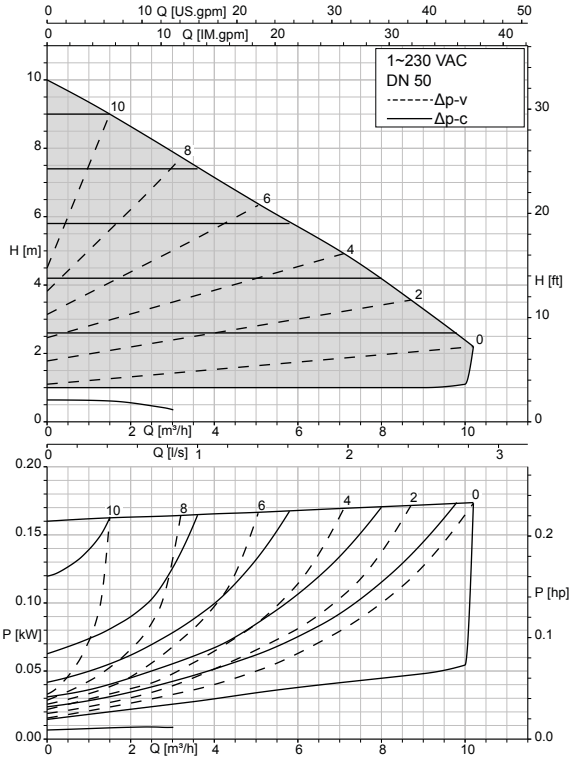
Calio 50-80 Δpv, Δpc



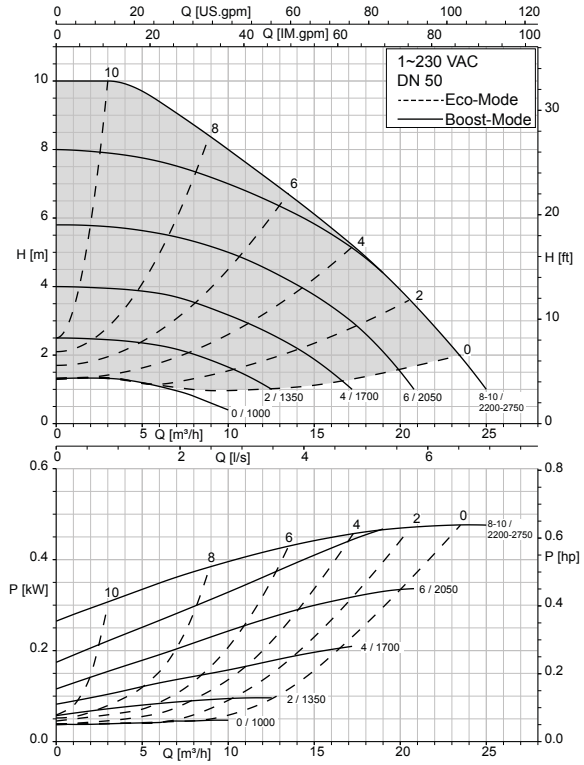
Calio 50-90 Boost, Eco Mode



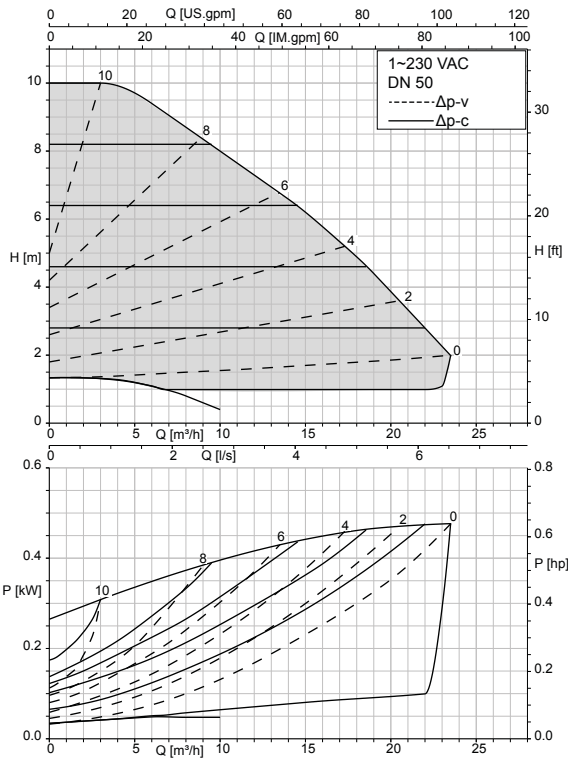
Calio 50-90 Δpv, Δpc



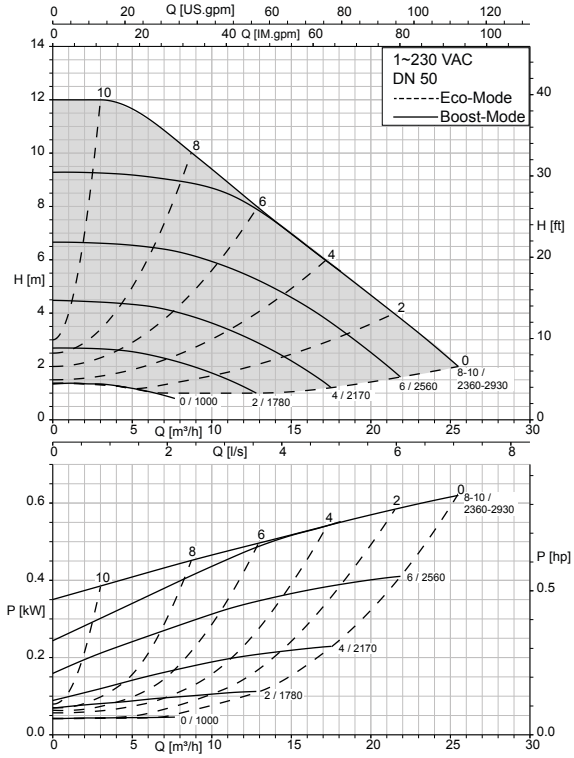
Calio 50-100 Boost, Eco Mode



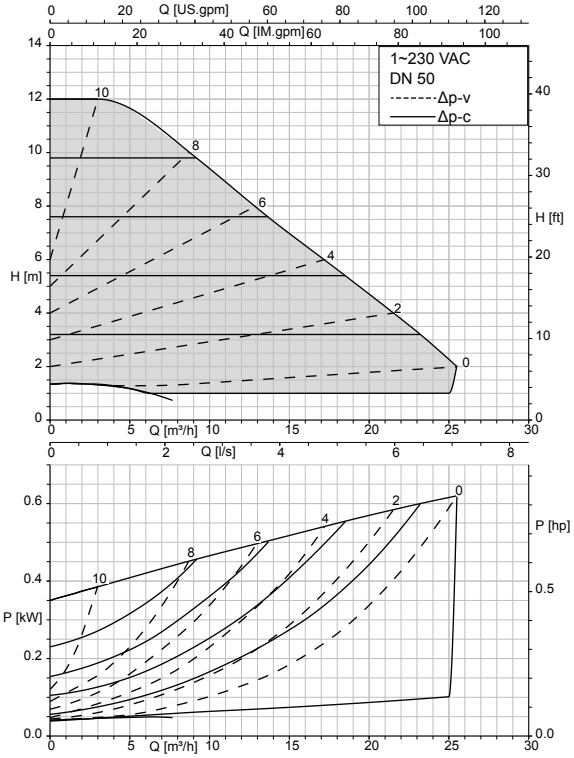
Calio 50-100 Δpv, Δpc



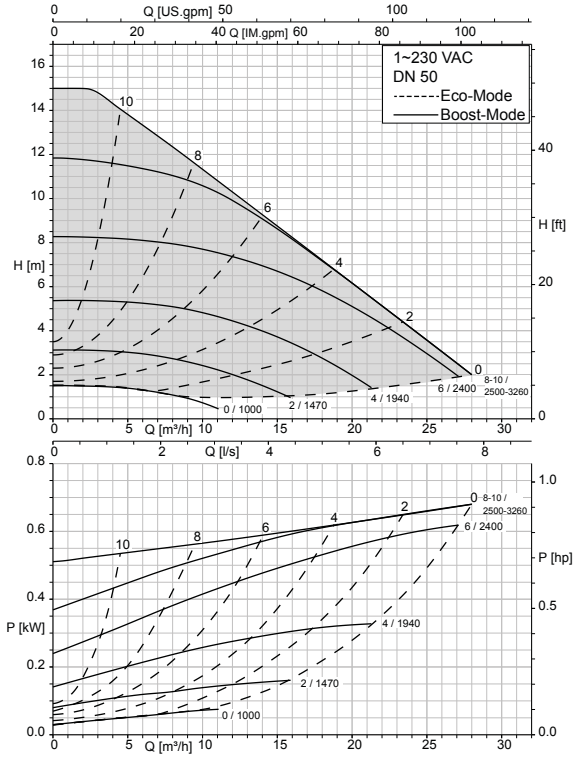
Calio 50-120 Boost, Eco Mode



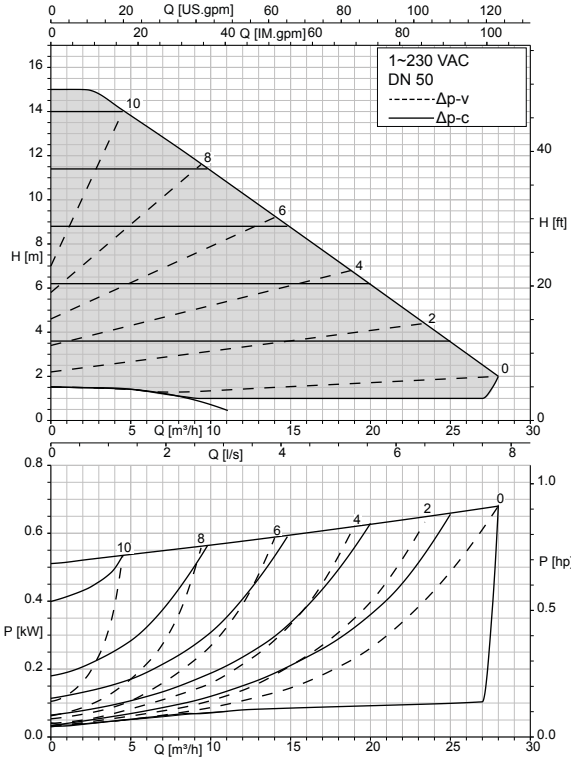
Calio 50-120 Δpv, Δpc



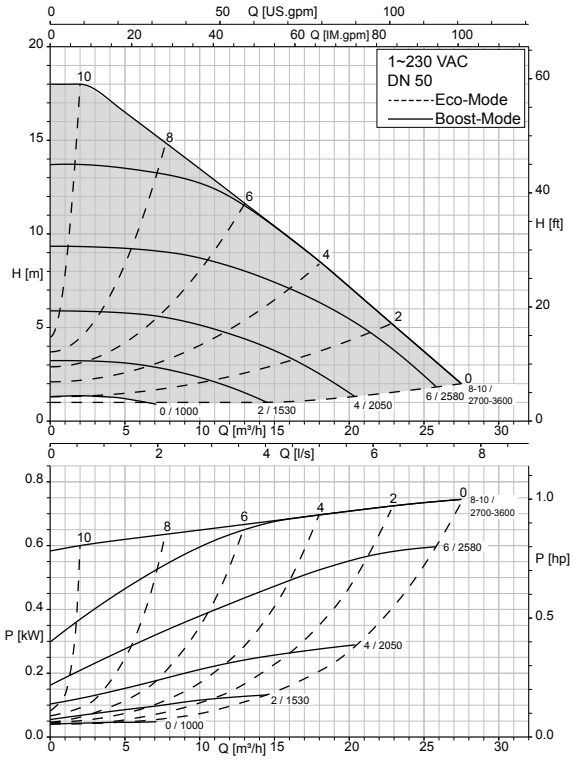
Calio 50-150 Boost, Eco Mode



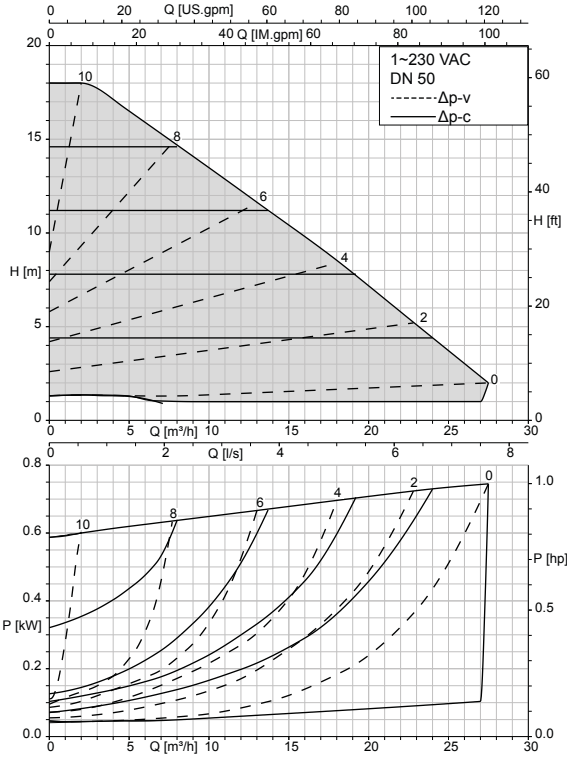
Calio 50-150 Δpv, Δpc



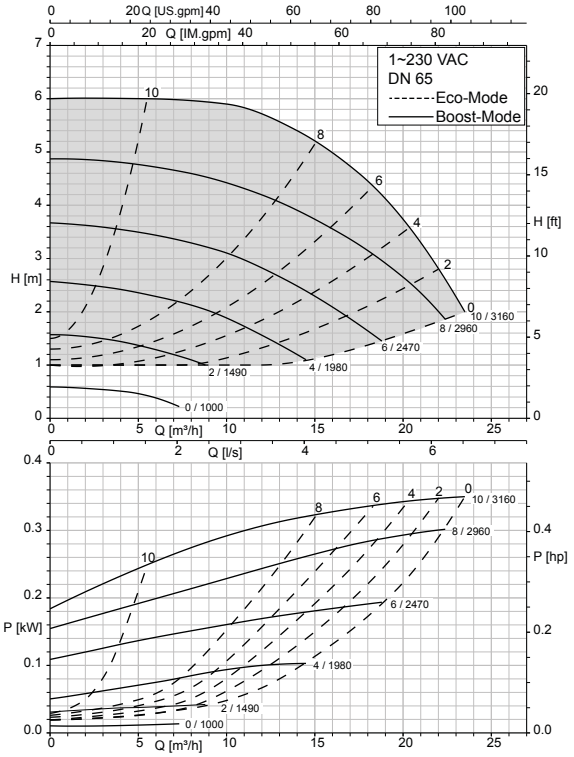
Calio 50-180 Boost, Eco Mode



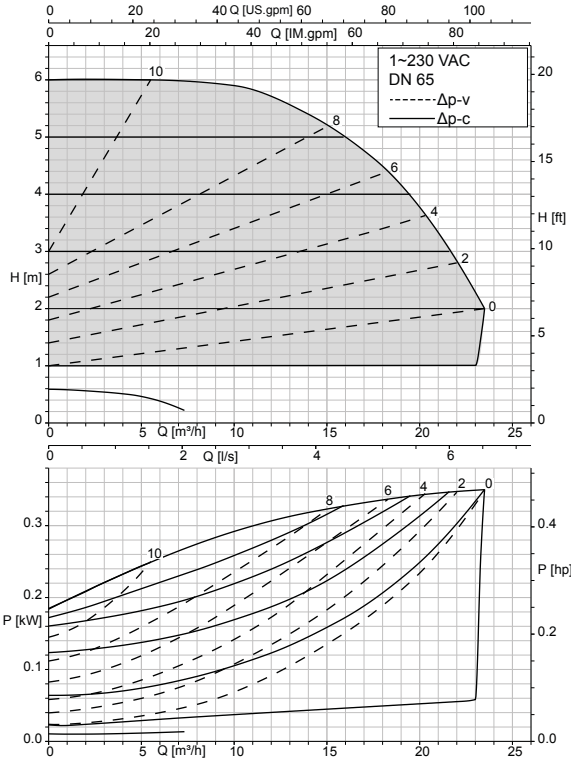
Calio 50-180 Δpv, Δpc



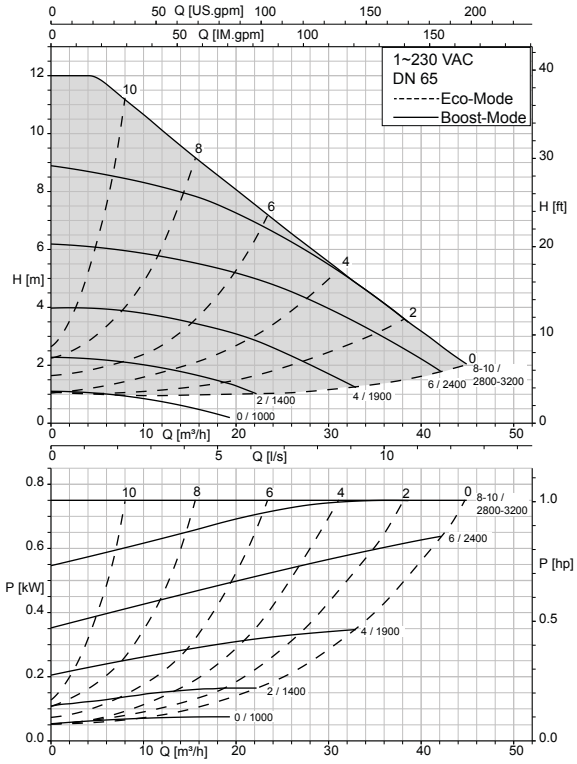
Calio 65-60 Boost, Eco Mode



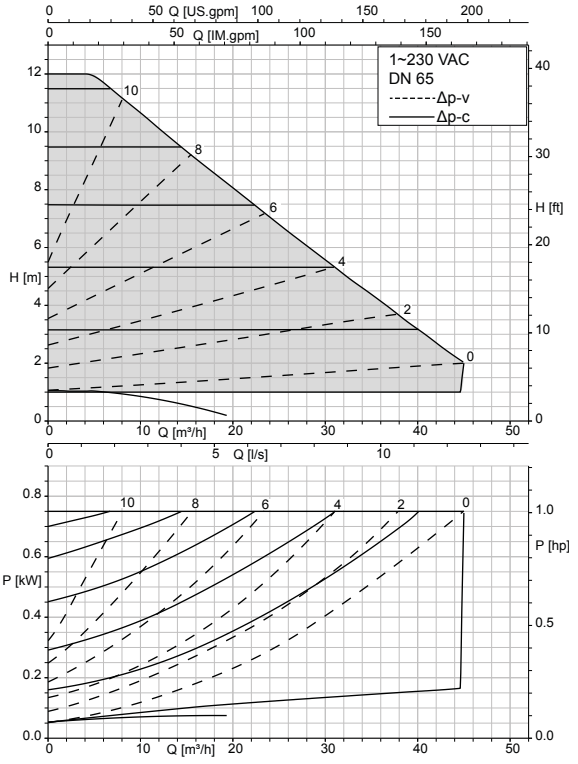
Calio 65-60 Δpv, Δpc



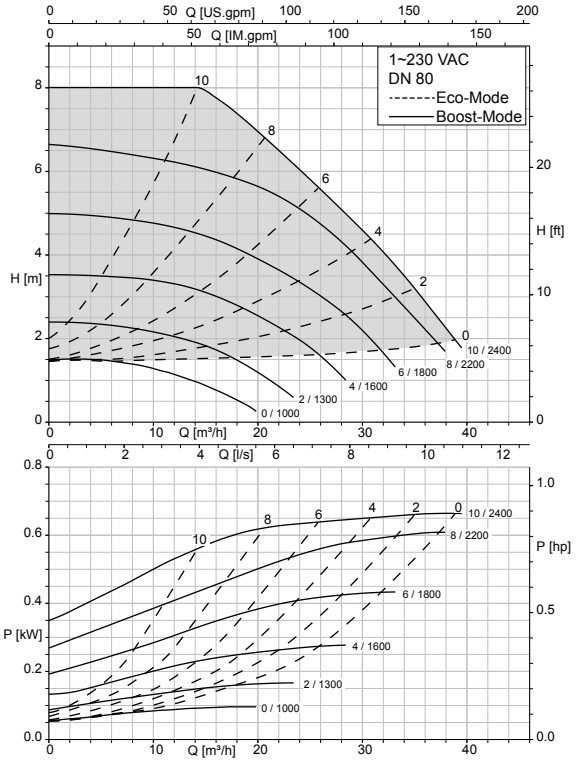
Calio 65-120 Boost, Eco Mode



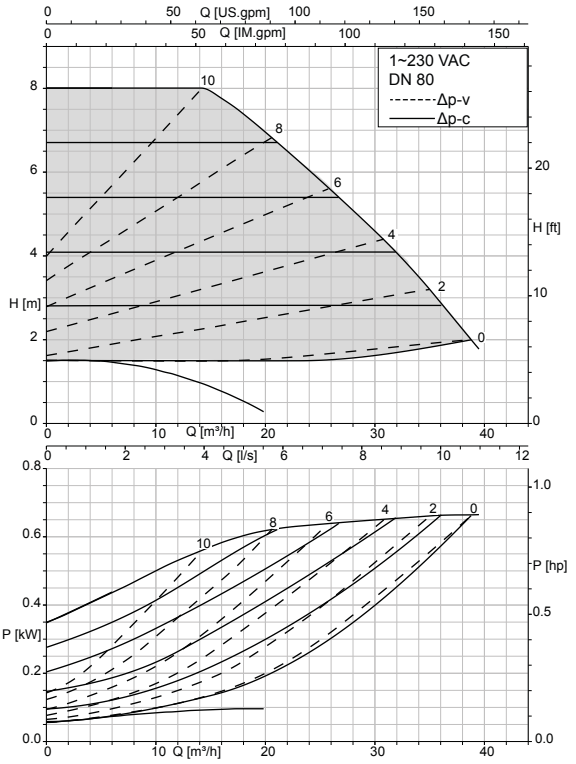
Calio 65-120 Δpv, Δpc



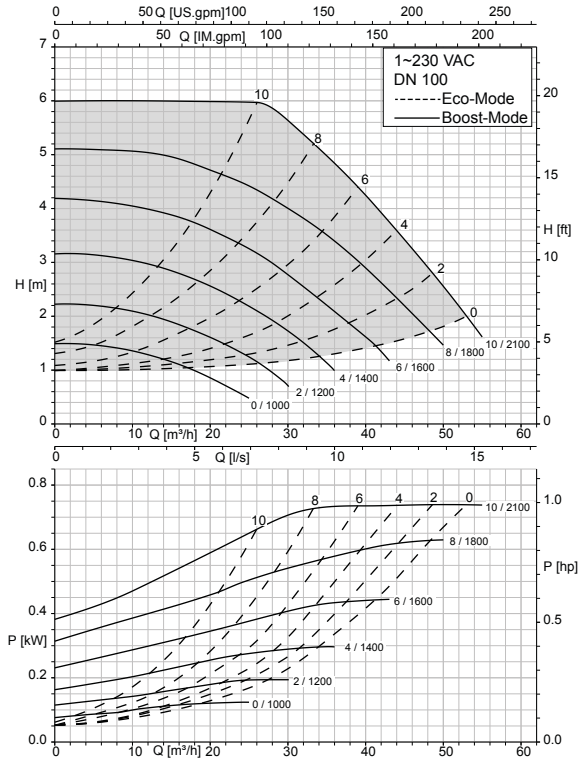
Calio 80-80 Boost, Eco Mode



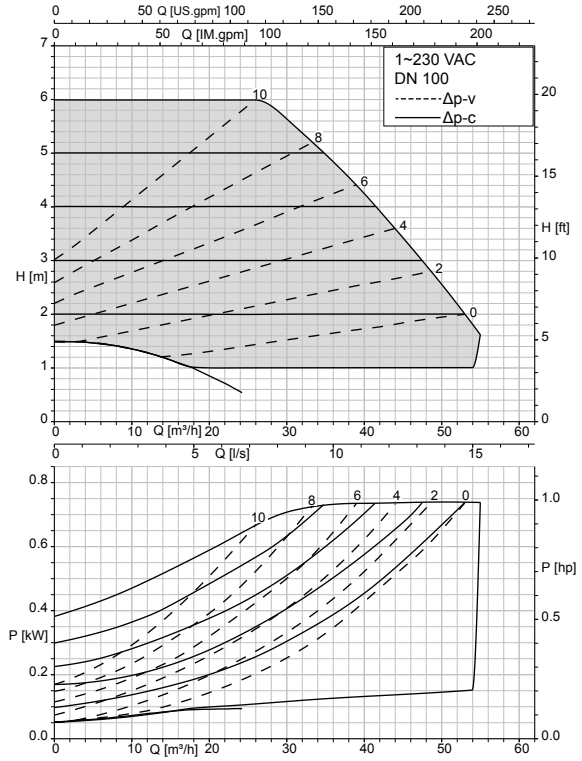
Calio 80-80 Δpv, Δpc



Calio 100-60 Boost, Eco Mode

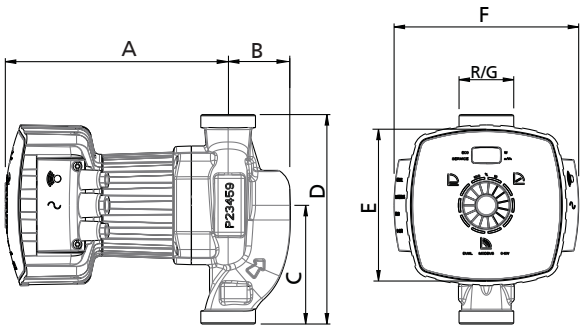


Calio 100-60 Δpv, Δpc

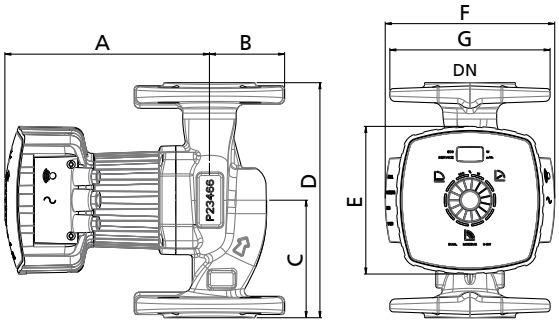


Dimensions

Calio



Screw-ended pump



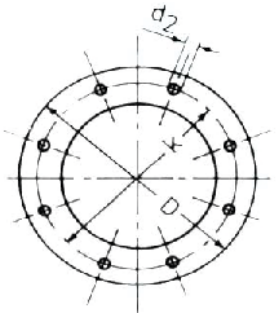
Flanged pump

Dimensions [mm]

Size	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	-	245	56	98	180	140	160
32-120	-	-	32	245	65	110	220	140	160
40-60	-	-	40	192	70	110	220	140	160
40-70	-	-	40	192	70	110	220	140	160
40-80	-	-	40	255	70	120	220	140	160
40-90	-	-	40	192	70	110	220	140	160
40-100	-	-	40	255	70	120	220	140	160
40-120	-	-	40	382	76	135	250	206	240
40-180	-	-	40	382	76	135	250	206	240
50-40	-	-	50	192	78	120	240	140	160
50-60	-	-	50	256	78	130	240	140	160
50-80	-	-	50	256	78	130	240	140	160
50-90	-	-	50	192	78	120	240	140	160
50-100	-	-	50	382	77	140	280	206	240
50-120	-	-	50	382	77	140	280	206	240
50-150	-	-	50	382	77	140	280	206	240
50-180	-	-	50	382	77	140	280	206	240
65-60	-	-	65	257	89	170	340	140	160
65-120	-	-	65	387	100	170	340	206	240
80-80	-	-	80	387	103	170	360	206	240
100-60	-	-	100	387	120	210	450	206	240

Flange design

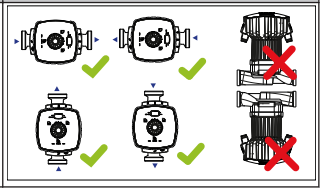
Dimensions [mm]

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 Ø19	
DN 40	130	100	4 x Ø14	150	110	4 x Ø19	
DN 50	140	110	4 x Ø14	165	125	4 x Ø19	
DN 65	160	130	4 x Ø14	185	145	4 x Ø19	
DN 80	190	150	4 x Ø19	200	160	8 x Ø19	
DN 100	210	170	4 x Ø19	220	180	8 x Ø19	

Installation information

Calio

Permissible installation positions

Sizes	
All	

Scope of supply

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

Accessories

Electrical accessories

	Description		Mat. No.	[kg]
	Programmable industrial PC BACnet IP gateway Smart With 2 serial interfaces as BACnet server for integrating standard and proprietary BACnet protocols/field bus protocols in BACnet systems		01550857	0.995
	"System operational" signalling module for cabinet mounting[6)] For connection to a Calio pump		19075960	0.2

6) Available from May 2015

	Description		Mat. No.	[kg]
	"System operational" signalling module for wall mounting[6)] For connection to a Calio pump		19075970	0.4
	"System operational" signalling module for wall mounting For connection of up to 6 Calio pumps		01550860	1

Cold water insulation

	Description	For size	Mat. No.	[kg]
	Diffusion-tight insulation for cooling applications	25-60, 25-80, 25-100, 30-60, 30-80, 30-100	19075685	0.2
		30-120[7)]	19075963	0.2
		32-120[7)]	19075964	0.2
		40-60, 40-70, 40-90	19075686	0.2
		40-80, 40-100[7)]	19075965	0.2
		50-40, 50-90	19075687	0.2
		50-60, 50-80[7)]	19075961	0.2
		65-60[7)]	19075962	0.2

Pipe unions

	Description	Mat. No.	[kg]
	2 pipe unions 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 pipe unions 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 pipe unions with G 2 union nut and insert with Rp 1 ¼ internal thread, steel For pumps with G 2 external thread / R 1 ¼ pipe connection	19075562	0.2

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

7) Available from June 2015

30.07.2015

1157.52/08-EN

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