



High-efficiency Heating Circulator

Calio Pro Plus Z

Type Series Booklet



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Type Series Booklet Calio Pro Plus Z

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Heating

Variable Speed Heating Circulators

Calio Pro Plus Z



Main applications

- Heating, ventilation, air-conditioning, cooling and 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
- Higher-viscosity fluids (water/glycol mixture up to a mixing ratio of 1:1)

Operating data

Table 1: Operating properties

Characteristic		Value	
		$P_1 \leq 400 \text{ W}$	$P_1 > 400 \text{ W}$
Flow rate	Q [m³/h]	$\leq 49,5$	
	Q [l/s]	$\leq 13,75$	
Head	H [m]	≤ 18	
Fluid temperature	T [°C]	≥ -10	
		≤ 110	
Ambient temperature	T [°C]	≥ 0	
		≤ 40	
Relative humidity	rF [%]	≤ 95	
Operating pressure	p [bar]	≤ 16	
Pressure class	PN [bar]	6/10/16	
Average sound pressure level	[dB (A)]	< 37	< 52
Screw-ended connection	G	2	
Flanged connection	DN	32 - 65	

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
- Enclosure IPX4D
- Thermal class F
- Temperature class TF 110
- Size-dependent energy efficiency index EEI (⇒ Page 10)
- Interference emissions EN 55014-1, EN 61000-3-2, EN 61000-3-3

$P_1 \leq 400 \text{ W}$:

- Interference immunity EN 55014-2

$P_1 > 400 \text{ W}$:

- Interference immunity EN 55014-2EN 61000-6-2

Bearings

- Product-lubricated special plain bearing

Connections

- Screw-ended or flanged

Operating modes

- Constant-pressure control
- Proportional-pressure control
- Dynamic Control
- Constant speed (open-loop control)
- Constant-flow-rate control

- Constant-temperature control
- Temperature-governed differential pressure control (can only be activated via the KSB FlowManager app or KSB ServiceTool)
- Differential-temperature control (can only be activated via the KSB FlowManager app or KSB ServiceTool)¹⁾

Automatic functions

- Continuously variable speed adjustment depending on the mode of operation
- Dual-pump operation
- Peak load operation (can only be activated via the KSB FlowManager app or KSB ServiceTool)
- Setback operation
- Calorimeter¹⁾
- Deblocking function
- Self-venting function of the pump casing
- Functional check run
- Soft start
- Full motor protection with integrated trip electronics

Manual functions

- Remote ON/OFF
- Setting the operating mode
- Setting the discharge head setpoint
- Setting the flow rate setpoint
- Setting the temperature setpoint
- Setting the speed
- Rotor space venting function
- Vent plug
- Locking the control panel
- 0/2 - 10 V with external differential pressure/speed setpoint
- 0 - 10 V as input of the actual value of the temperature or actual value of the differential pressure

Signalling functions and display functions

- Periodically alternating display of flow rate, head and electrical input power
- Operating condition and error codes shown on the display, in the KSB FlowManager app or in the KSB ServiceTool
- Configurable general fault message and "in operation" message (volt-free changeover contacts)
- Serial digital Modbus RTU interface
- Bluetooth interface for the KSB FlowManager app or KSB ServiceTool
- Service interface for KSB ServiceTool

Designation

Example: Calio Pro Plus Z 25-40

Table 2: Designation key

Code	Description	
Calio Pro Plus	Type series	
	_2)	Single pump
	Z	Twin pump
25	Connection	
	25	G 1 1/2
	30	G 2
	32	DN 32
	40	DN 40
	50	DN 50
	65	DN 65
	80 ³⁾	DN 80
	100 ³⁾	DN 100
40	Head H ⁴⁾ [m]	
	40	Head × 10 Example: 4 m × 10 = 40

- 1 One external temperature sensor is required as a minimum.
- 2 Blank
- 3 Not available as twin pump
- 4 At flow rate Q = 0 m³/h

Materials

Table 3: Overview of available materials

Part No.	Description	Material
102	Volute casing	Grey cast iron with cathodic electrocoating (EN-GJL-200)
210	Shaft	Stainless steel 1.4034
230	Impeller	Glass fibre reinforced plastics (P1 ≤ 400 W: PSU-GF30, P1 > 400 W: PPS-GF40)
310	Bearings	Ceramics / carbon
689	Thermal insulation shells	Polypropylene
817	Can	Glass fibre reinforced plastic (PPS-GF40)

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

Product benefits

- **Highest energy efficiency with Dynamic Control**
 - Patented Dynamic Control for up to 40 percent additional energy savings as compared with proportional-pressure control
 - Practically rules out undersupply in changing system conditions
 - Optimised efficiencies exceeding the requirements of the energy efficiency regulations
- **Easy to install and commission**
 - All operating modes, functions and setpoints in metres are easy and fast to adjust at the pump or via the Bluetooth interface.
 - Quick and straightforward commissioning with the FlowManager app
 - With the FlowManager app all electrical connections can easily and flexibly be configured for the specific application.
 - In the FlowManager app all pump information is quickly accessible via the Favourites menu. Process values are clearly illustrated in a diagram.
- **Universal use**
 - One pump for three pressure classes: PN 6/PN 10/PN 16
 - New and enhanced characteristic curves offer a larger operating range.
 - Flexible pump functions, such as an operating point display, integrated dual-pump operation and heat meter
- **High operating reliability**
 - High operating reliability thanks to built-in pump and motor protection equipment
 - A maintenance-free motor with a carbon fibre reinforced plastic can and an integrated filtering concept provide protection against contamination with magnetite, for example.
 - High availability by dual-pump configuration and integrated protective functions
- **Connectivity**
 - Modbus RTU interface integrated as standard
 - Flexible connectivity by plug-in modules for all common building management systems
 - Two parameterisable relays for operation and fault messages
 - Configurable digital input and adjustable analog input
- **Environmentally friendly**
 - Maximum energy efficiency
 - Energy meter
 - Life Cycle Impact Assessment (LCIA) based on ISO 14040 / 14044

Product information

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

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see <https://www.ksb.com/en-global/company/corporate-responsibility/reach>.

Data access and use in accordance with Regulation (EU) 2023/2854 (EU Data Act)

Table 4: Device data recorded

Data type	Format	Volume	Continuous generation / real-time generation	Data storage		Duration of retention
(Article 3, 2a)	(Article 3, 2a)	(Article 3, 2a)	(Article 3, 2b)	(Article 3, 2c)		(Article 3, 2c)
				Device	Remote server	
Stator winding temperatures (NTC)	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
SPM temperature (power electronics)	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
Current measurement (drive end)	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
DC link voltage	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
Analog input	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
Digital input	BOOL	1 byte	Yes	Yes	No	Instantaneous value
Pt1000 resistance thermometer	FLOAT32	4 bytes	Yes	Yes	No	Instantaneous value
Operating hours Pump	UINT32	4 bytes	Yes	Yes	-	Unlimited
Control board temperature	FLOAT32	4 bytes	Yes	Yes	-	Instantaneous value
Mains voltage	FLOAT32	4 bytes	Yes	Yes	-	Instantaneous value

Data access (Art. 3, 2d)

Authorised users can access the collected data in the following ways:

- Data stored on the device
 - Access:** The data stored on the device can be accessed using the KSB ServiceTool.
 - Interface:** The data stored on the device can be read out via an optional field bus interface.
- When an optional field bus interface is used, data may be stored on a **remote server** provided by the customer.
 - Access:** The customer is responsible for managing, securing and updating the access data.
 - Technical details:** The customer is responsible for access rights, data storage and data deletion.
 - Data format:** Exported data can be processed in commonly used tools (e.g. Excel, ERP systems).
- When an optional field bus interface is used, no data is stored on a **KSB remote server**.

The requirements regarding the information obligation under the EU Data Act for related services such as KSB ServiceTool and KSB Delta FlowManager are set out in a separate document. Only the data of the connected product itself is shown here.

Available software/apps

KSB ServiceTool



This software can be used to change the settings for the pump set and carry out a firmware update.

<https://www.ksb.com/en-gb/software-and-know-how/operational-tools/ksb-servicetool>



KSB FlowManager 2.0



This app can be used to change the settings for the pump set and carry out a firmware update.



Selection information

Minimum inlet pressure

The minimum inlet pressure $p_{\min}$ at the pump suction nozzle serves to avoid cavitation noises at the indicated fluid temperature $T_{\max}$.

The values indicated are gauge pressures relative to the ambient pressure and are valid for altitudes of up to 300 m above seal level. For installation at altitudes > 300 m, an allowance of 0.01 bar / 100 m must be added.

Table 5: Minimum inlet pressure $p_{\min}$ specified for the fluid temperature $T_{\max}$.

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

Permissible fluid temperature

Table 6: Temperature limits of the fluid handled

Permissible fluid temperature	Value
Maximum	+110 °C
Minimum	-10 °C

Permissible ambient temperature

Table 7: Permissible ambient temperatures

Permissible ambient temperature	Value
Maximum	+40 °C
Minimum	0 °C

Description of the Modbus interface

Table 8: Technical data of the Modbus interface

Characteristic	Value
Terminal cross-section	1,5 mm ²
Interface	RS485 (TIA-485-A) optically isolated
Bus connection	0.5 mm ² , shielded twisted pair bus cable
Cable length	≤ 1000 m - Stub line impermissible - For cable lengths > 30 m take suitable measures to ensure overvoltage protection.
Wave impedance	120 Ω (cable type B to TIA 485-A)
Data rates	4800, 9600, 38400, 57600, 115200 baud (19200 baud = factory setting)
Protocol	Modbus RTU standard
Data format	8 data bits - Parity EVEN / ODD / NONE 1 stop bit
Modbus address	ID #1 to #247 selectable (ID #17 = factory setting)

 Further description see operating manual of the pump set.

Description of the Dynamic Control function

The dynamic control (2) system detects when the selected control curve (3) is higher than the minimum characteristic curve⁵⁾ (4). The control system shifts the control curve downward, and power input

is reduced automatically. To ensure sufficient supply the pump set switches to a higher control curve when the minimum characteristic curve is reached. The energy input is reduced (1) without any negative impact on the supply of the building.

⁵ Characteristic curve at fully open thermostatic valves

The pump set is operated in an optimised way, even if the system characteristic curve is unknown; the noise at the thermostatic valves is reduced.

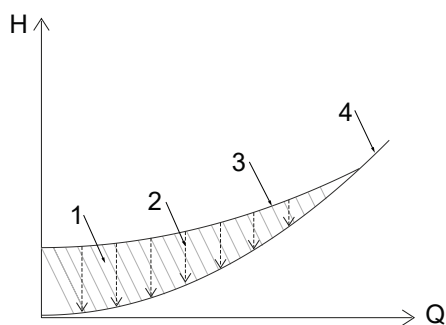


Fig. 1: Principle of Dynamic Control

1	Excess energy input	3	Control curve
2	Dynamic Control	4	Minimum characteristic curve

Description of the characteristic curve

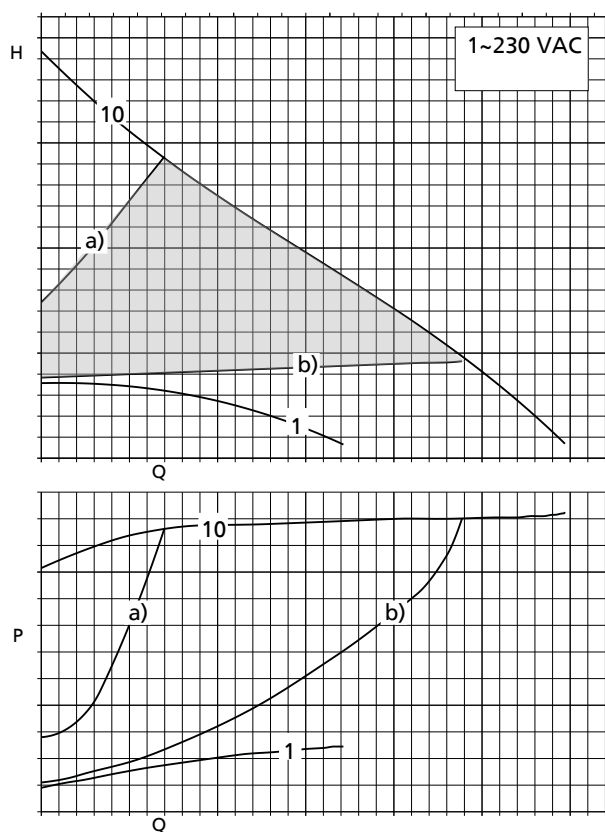


Fig. 2: Selection example

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

The characteristic curve can be adjusted between a) and b) in increments of 0.1 m. This adjustment can be made with the control buttons.

Technical data
Calio Pro Plus Z
Table 9: Technical data

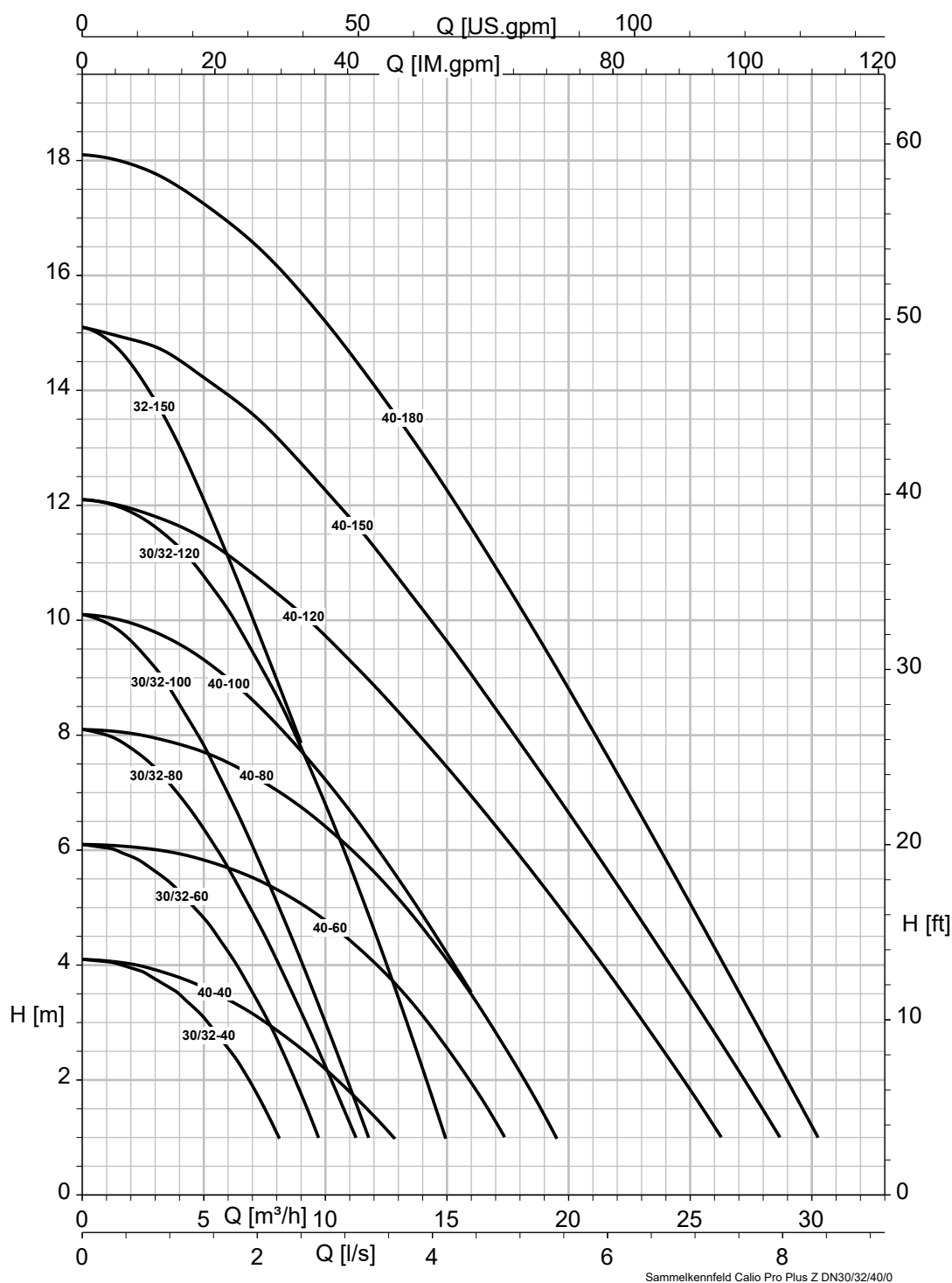
Size	Connection		PN [bar]	n		P ₁ [W]	I _N 1~230 V AC, 50 Hz/60 Hz [A]	EEI ⁽⁶⁾	Mat. No.	[kg]
	Piping	Pump		Min.	Max.					
				[rpm]	[rpm]					
30-40	R 1 1/4 ⁷⁾	G 2	6/10/16	1000	3000	2,5 - 105	0,10 - 1,00	0,19	29135525	13.8
30-60	R 1 1/4 ⁷⁾	G 2	6/10/16	1000	3600	2,5 - 165	0,10 - 1,08	0,19	29135526	13.8
30-80	R 1 1/4 ⁷⁾	G 2	6/10/16	1000	4100	2,5 - 235	0,10 - 1,21	0,19	29135527	13.8
30-100	R 1 1/4 ⁷⁾	G 2	6/10/16	1000	4600	2,5 - 260	0,10 - 1,35	0,19	29135528	14.4
30-120	R 1 1/4 ⁷⁾	G 2	6/10/16	1000	4100	2,5 - 400	0,10 - 1,93	0,19	29135529	15.2
32-40	DN 32	DN 32	6/10/16	1000	3000	2,5 - 105	0,10 - 1,00	0,19	29135530	18.2
32-60	DN 32	DN 32	6/10/16	1000	3600	2,5 - 165	0,10 - 1,08	0,19	29135531	18.2
32-80	DN 32	DN 32	6/10/16	1000	4100	2,5 - 235	0,10 - 1,21	0,19	29135532	18.2
32-100	DN 32	DN 32	6/10/16	1000	4600	2,5 - 260	0,10 - 1,35	0,19	29135533	18.2
32-120	DN 32	DN 32	6/10/16	1000	4100	2,5 - 400	0,10 - 1,93	0,19	29135534	20
32-150	DN 32	DN 32	6/10/16	1000	4500	2,5 - 400	0,10 - 1,94	0,19	29135553	20
40-40	DN 40	DN 40	6/10/16	1000	2700	2,5 - 150	0,10 - 1,24	0,19	29135535	20.5
40-60	DN 40	DN 40	6/10/16	1000	3400	2,5 - 295	0,10 - 1,40	0,19	29135536	21.4
40-80	DN 40	DN 40	6/10/16	1000	3800	2,5 - 390	0,10 - 1,86	0,19	29135537	21.4
40-100	DN 40	DN 40	6/10/16	1000	4000	2,5 - 390	0,10 - 1,86	0,19	29135538	21.4
40-120	DN 40	DN 40	6/10/16	1000	3000	2,5 - 575	0,35 - 2,81	0,19	29135539	40.8
40-150	DN 40	DN 40	6/10/16	1000	3300	2,5 - 735	0,35 - 3,54	0,19	29135540	40.8
40-180	DN 40	DN 40	6/10/16	1000	3700	2,5 - 865	0,35 - 4,12	0,19	29135541	40.8
50-40	DN 50	DN 50	6/10/16	1000	3000	2,5 - 225	0,10 - 1,31	0,19	29135542	27.5
50-60	DN 50	DN 50	6/10/16	1000	3500	2,5 - 390	0,10 - 1,85	0,19	29135543	27.5
50-80	DN 50	DN 50	6/10/16	1000	3900	2,5 - 390	0,10 - 1,85	0,19	29135544	27.5
50-100	DN 50	DN 50	6/10/16	1000	2700	2,5 - 715	0,35 - 3,42	0,18	29135545	43.1
50-120	DN 50	DN 50	6/10/16	1000	3000	2,5 - 890	0,35 - 4,18	0,18	29135546	43.1
50-150	DN 50	DN 50	6/10/16	1000	3300	2,5 - 1325	0,35 - 6,18	0,18	29135547	47.3
50-180	DN 50	DN 50	6/10/16	1000	3600	2,5 - 1665	0,35 - 7,89	0,18	29135548	47.3
65-80	DN 65	DN 65	6/10/16	1000	2900	2,5 - 625	0,35 - 3,04	0,20	29135549	50.4
65-100	DN 65	DN 65	6/10/16	1000	3200	2,5 - 730	0,35 - 3,43	0,20	29135550	50.4
65-120	DN 65	DN 65	6/10/16	1000	3500	2,5 - 900	0,35 - 4,23	0,20	29135551	50.4
65-150	DN 65	DN 65	6/10/16	1000	3900	2,5 - 1620	0,35 - 8,22	0,20	29135552	52.9

6 The reference value for the most efficient of circulators is EEI ≤ 0.20.

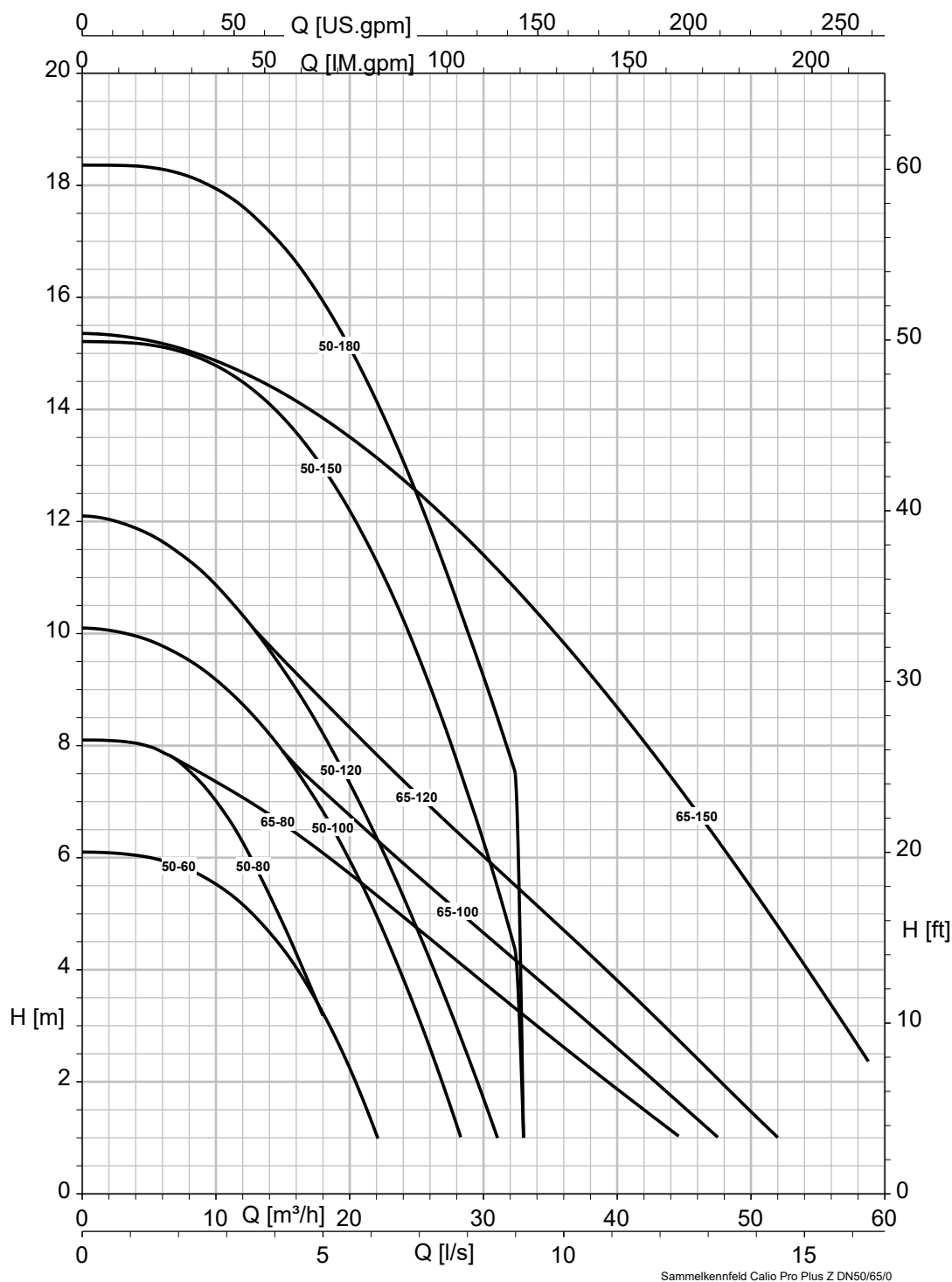
7 Connection using pump pipe unions (accessories)

Selection charts

Selection chart (connections 30-..., 32-..., 40-...)

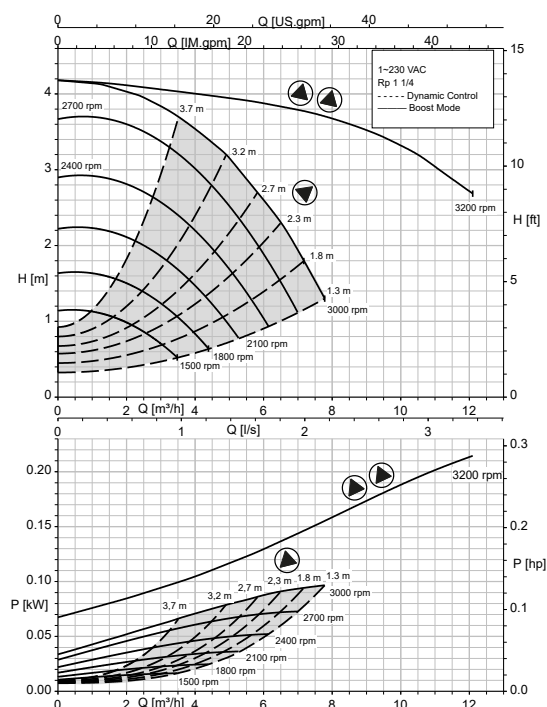


Selection chart (connections 50-..., 65-...)

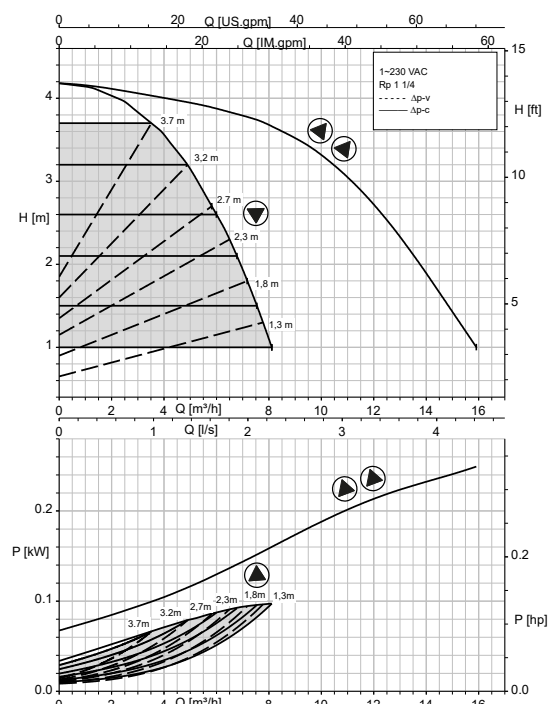


Characteristic curves

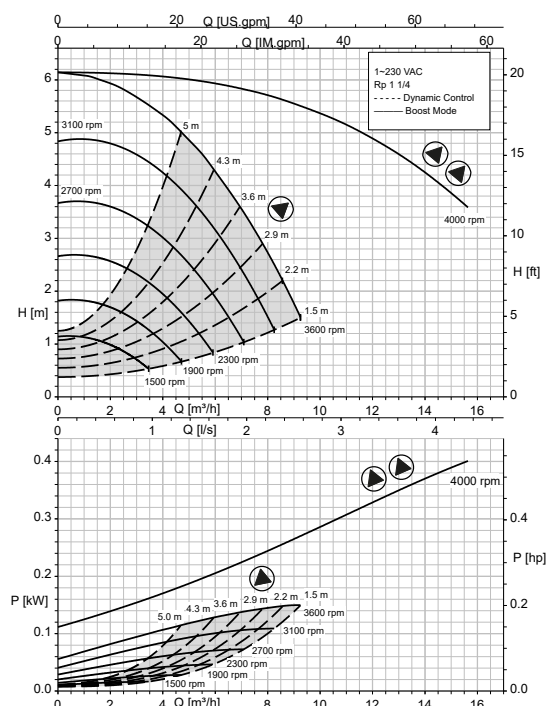
Calio Pro Plus Z 30-40 Open-loop Control, Dynamic Control



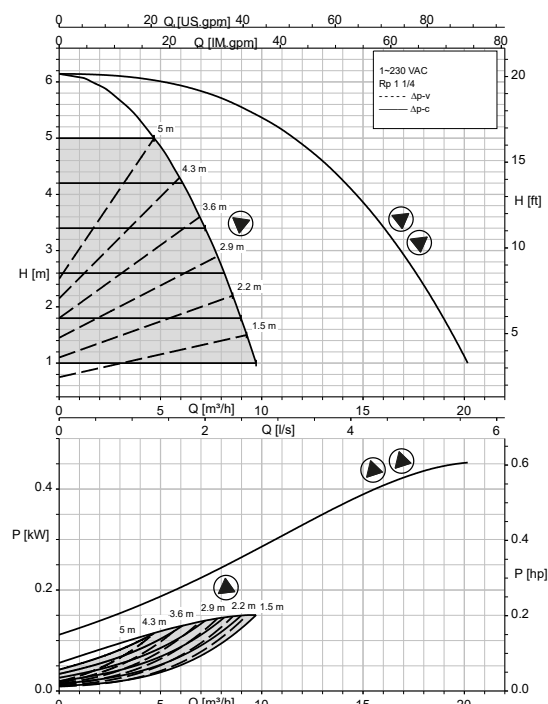
Calio Pro Plus Z 30-40 Δpv, Δpc



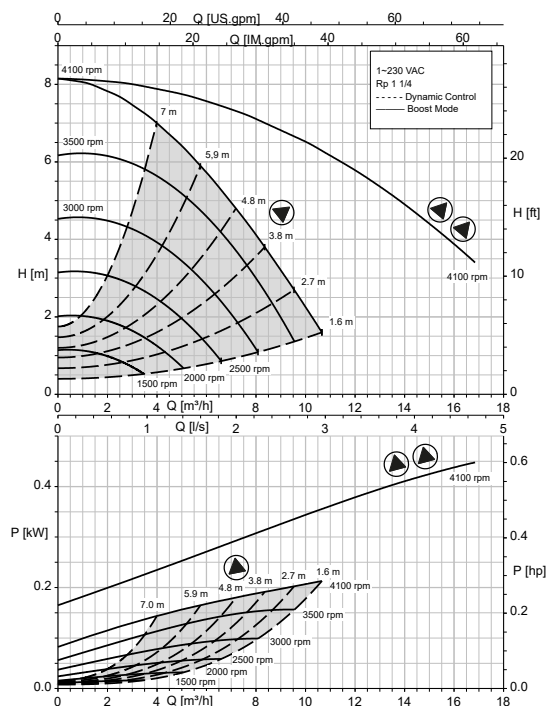
Calio Pro Plus Z 30-60 Open-loop Control, Dynamic Control



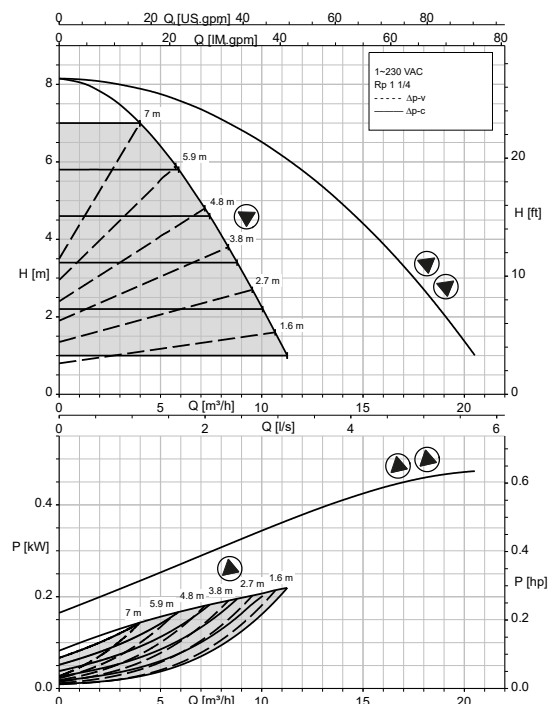
Calio Pro Plus Z 30-60 Δpv, Δpc



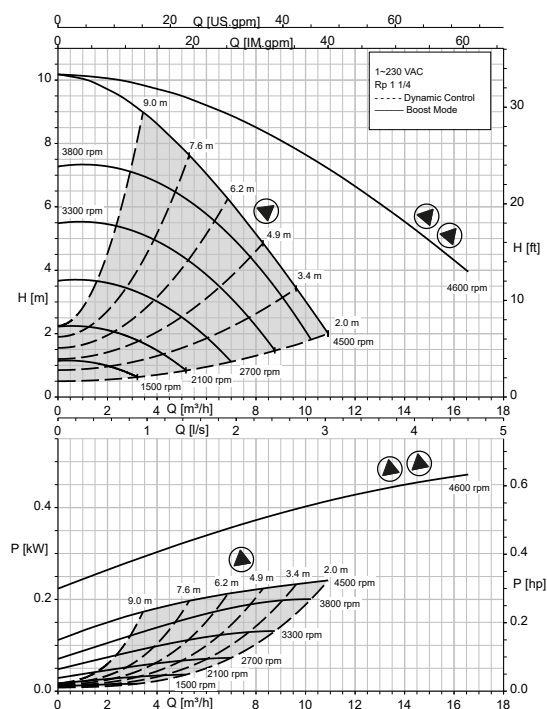
Calio Pro Plus Z 30-80 Open-loop Control, Dynamic Control



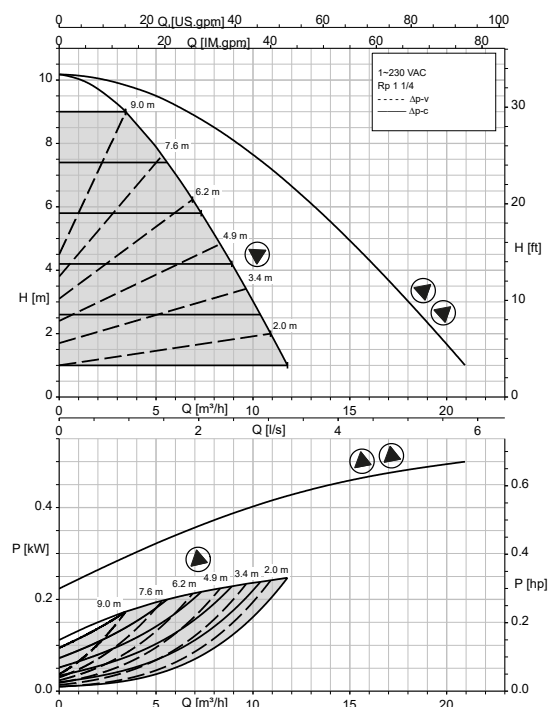
Calio Pro Plus Z 30-80 Δp_v , Δp_c



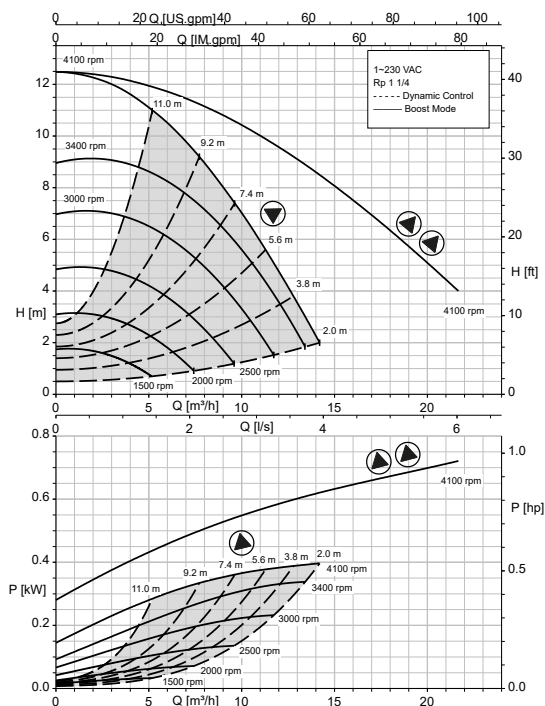
Calio Pro Plus Z 30-100 Open-loop Control, Dynamic Control



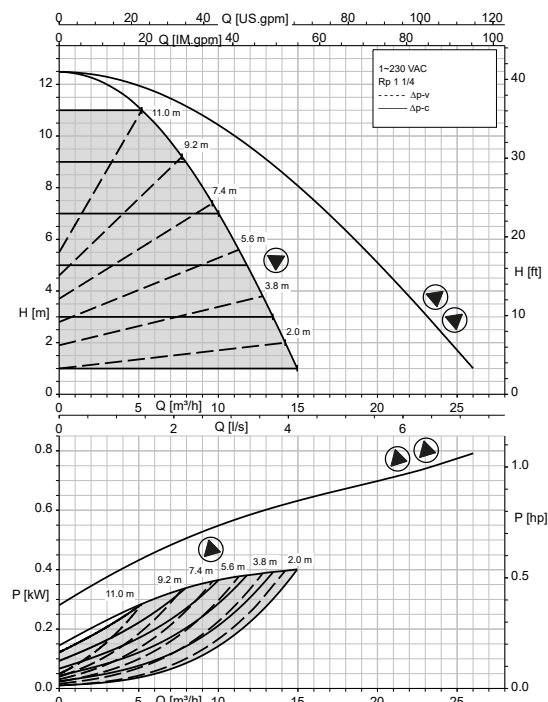
Calio Pro Plus Z 30-100 Δp_v , Δp_c



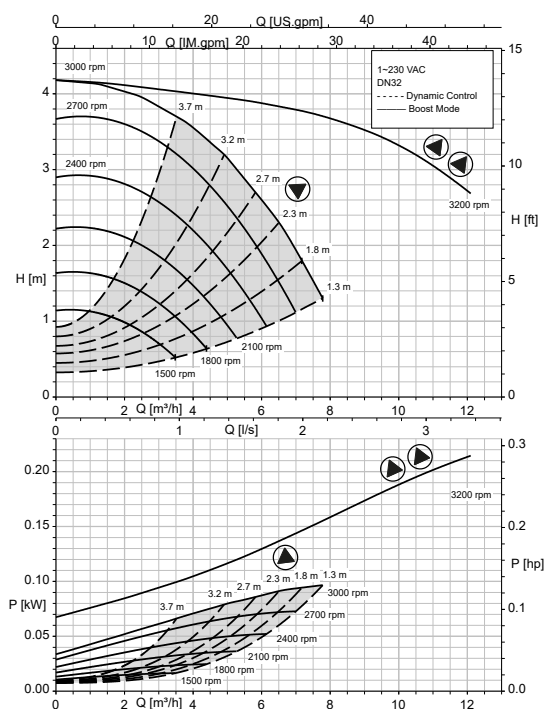
Calio Pro Plus Z 30-120 Open-loop Control, Dynamic Control



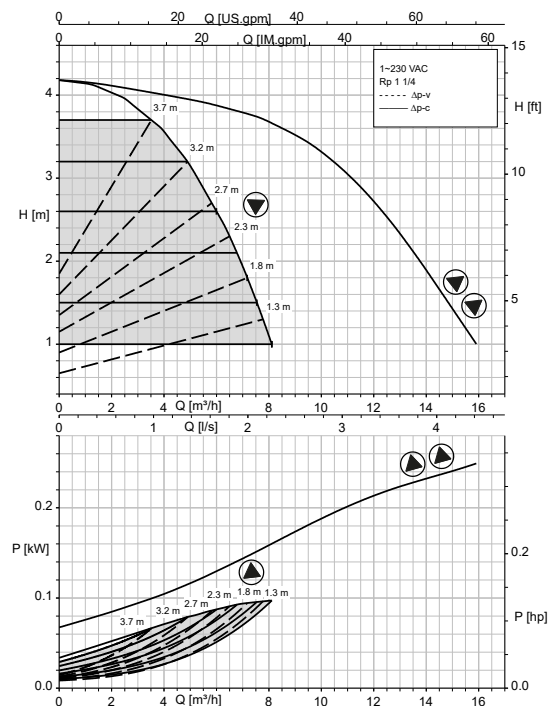
Calio Pro Plus Z 30-120 Δp_v , Δp_c



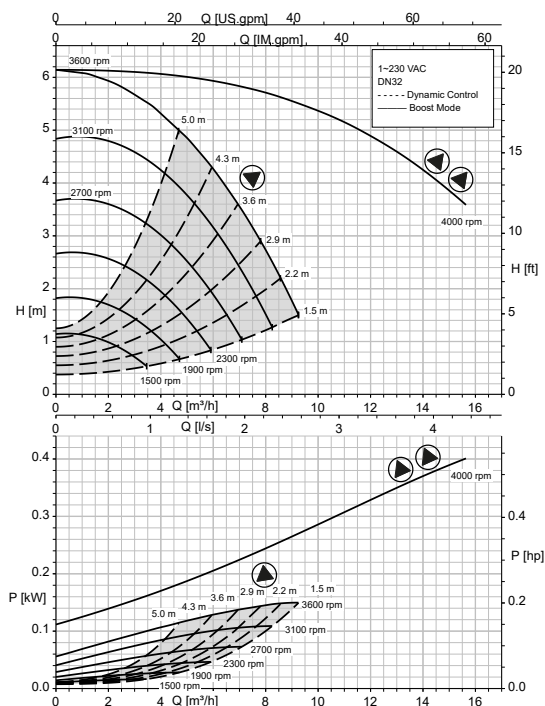
Calio Pro Plus Z 32-40 Open-loop Control, Dynamic Control



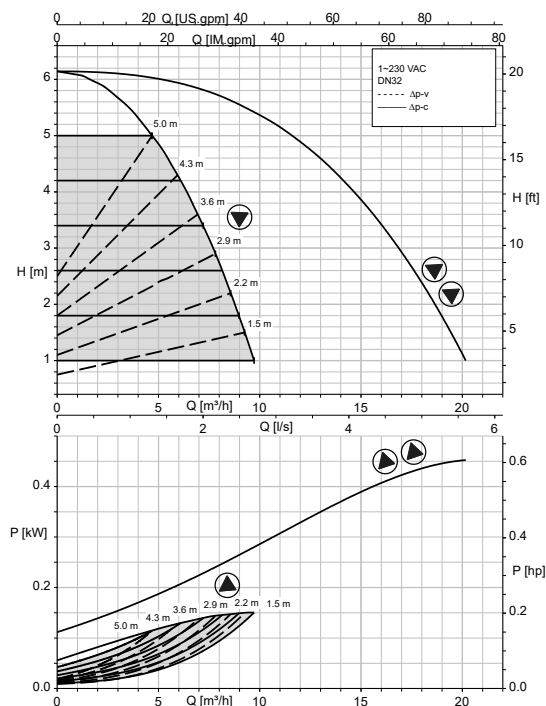
Calio Pro Plus Z 32-40 Δp_v , Δp_c



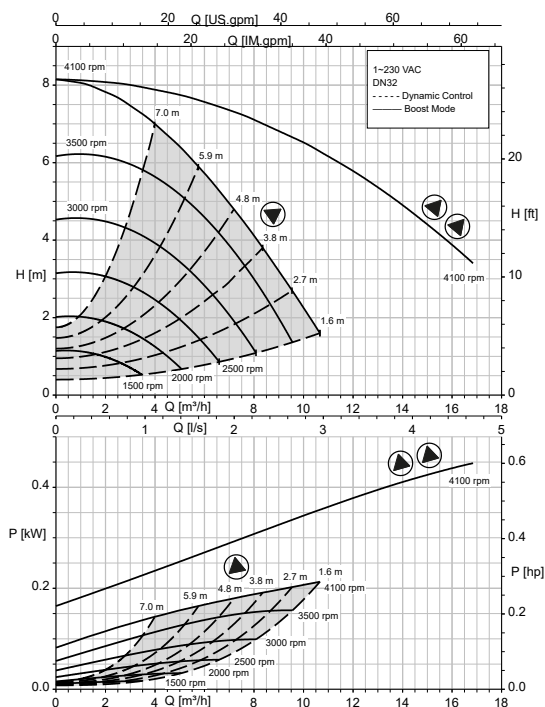
Calio Pro Plus Z 32-60 Open-loop Control, Dynamic Control



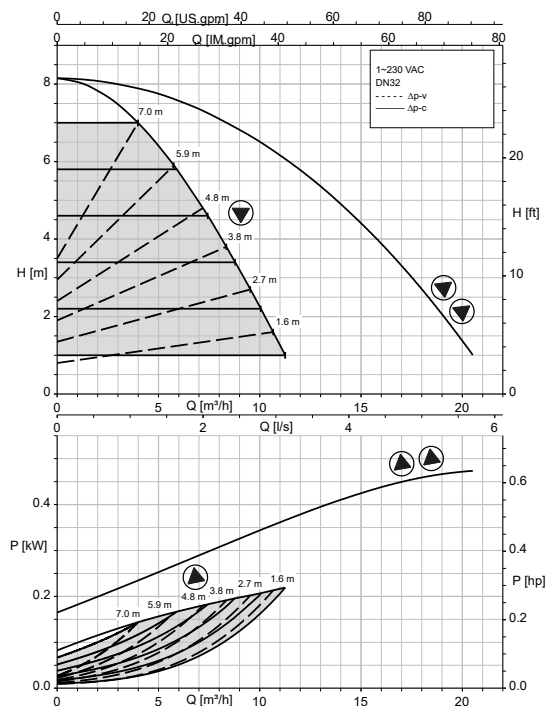
Calio Pro Plus Z 32-60 Δp_v , Δp_c



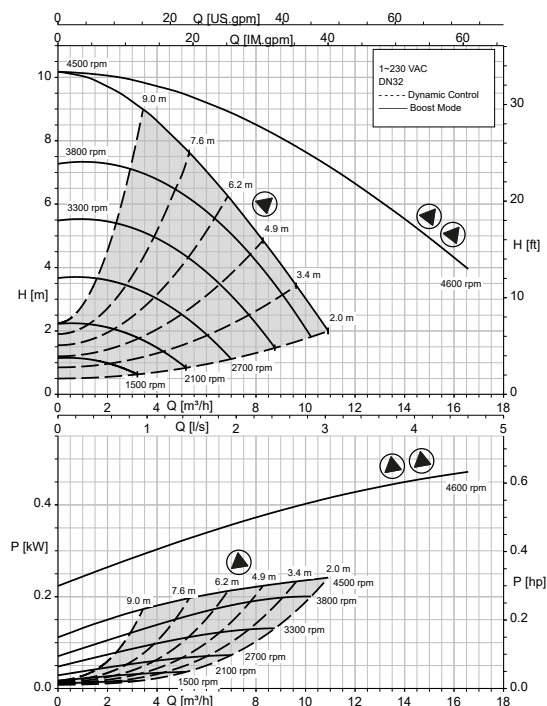
Calio Pro Plus Z 32-80 Open-loop Control, Dynamic Control



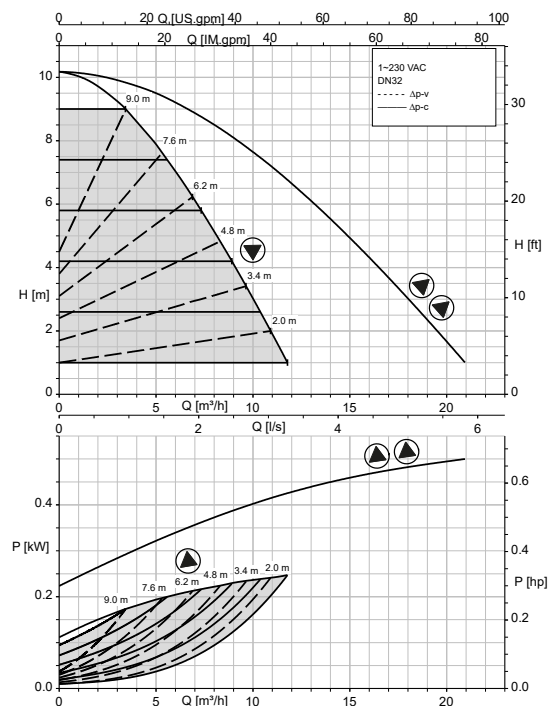
Calio Pro Plus Z 32-80 Δp_v , Δp_c



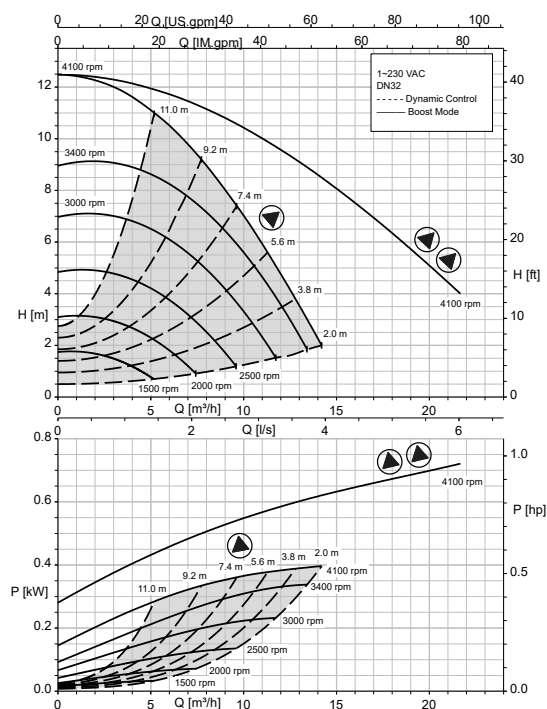
Calio Pro Plus Z 32-100 Open-loop Control, Dynamic Control



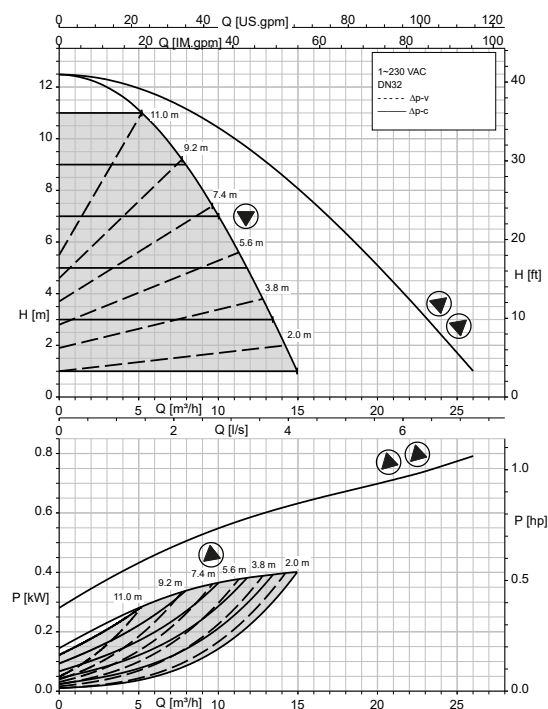
Calio Pro Plus Z 32-100 Δp_v , Δp_c



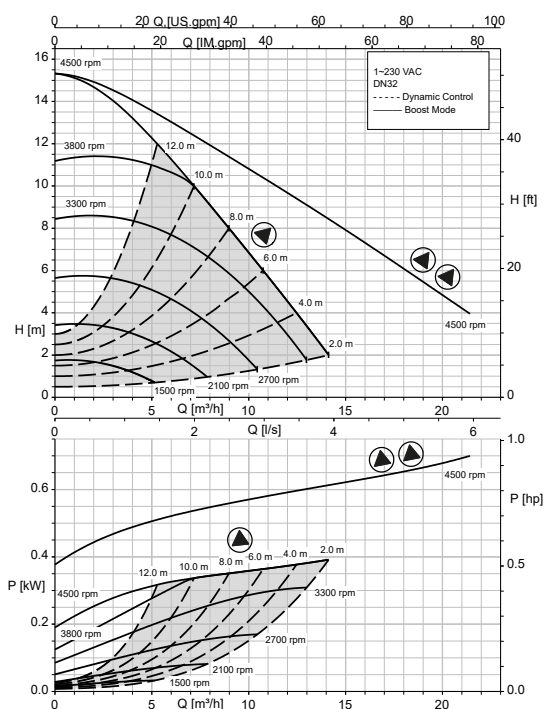
Calio Pro Plus Z 32-120 Open-loop Control, Dynamic Control



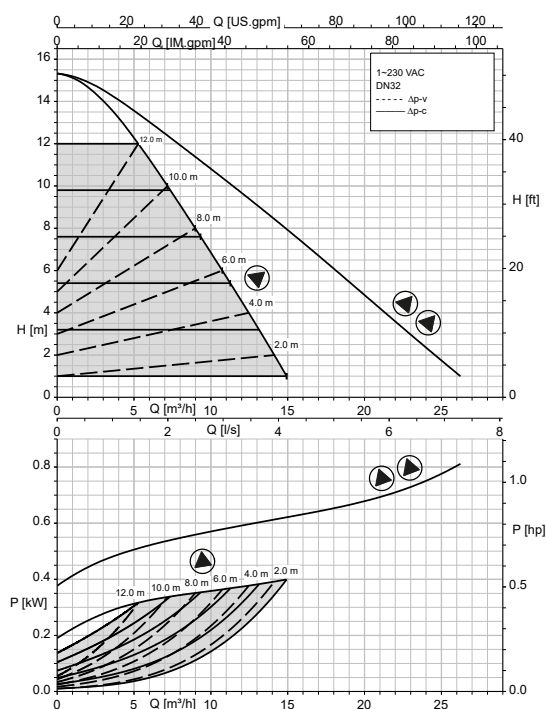
Calio Pro Plus Z 32-120 Δp_v , Δp_c



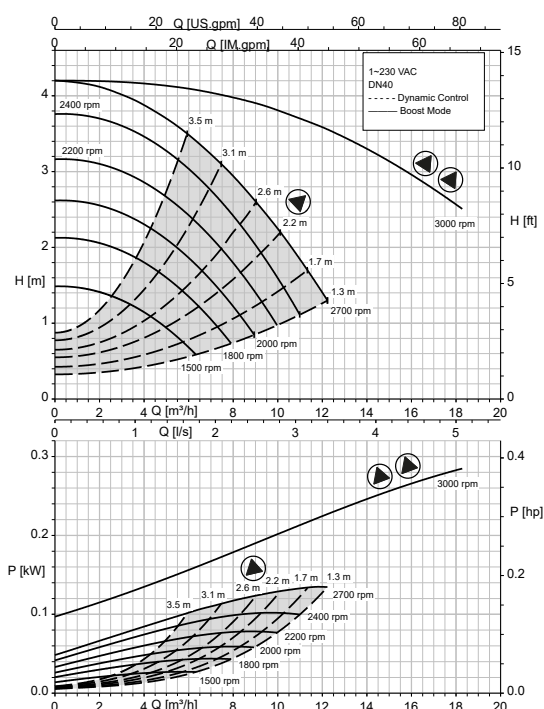
Calio Pro Z 32-150 Open-loop Control, Dynamic Control



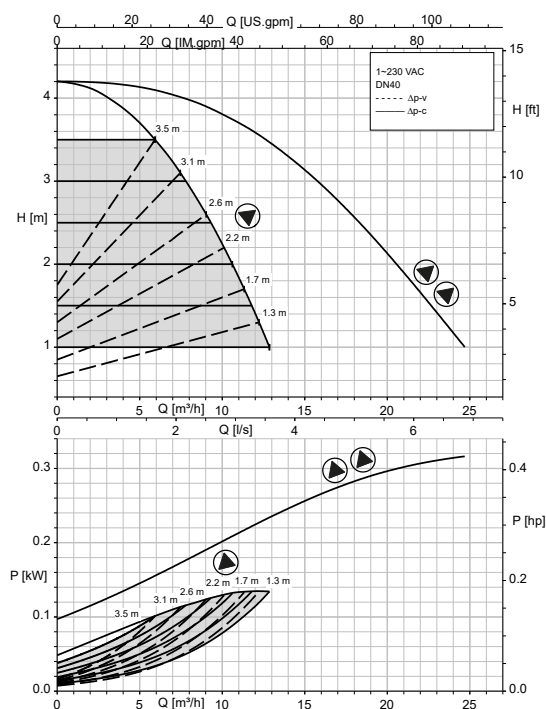
Calio Pro Plus Z 32-150 Δp_v , Δp_c



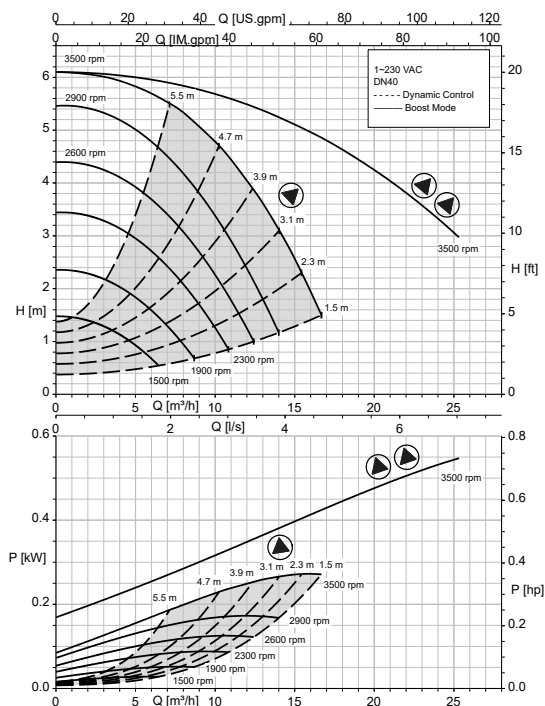
Calio Pro Plus Z 40-40 Open-loop Control, Dynamic Control



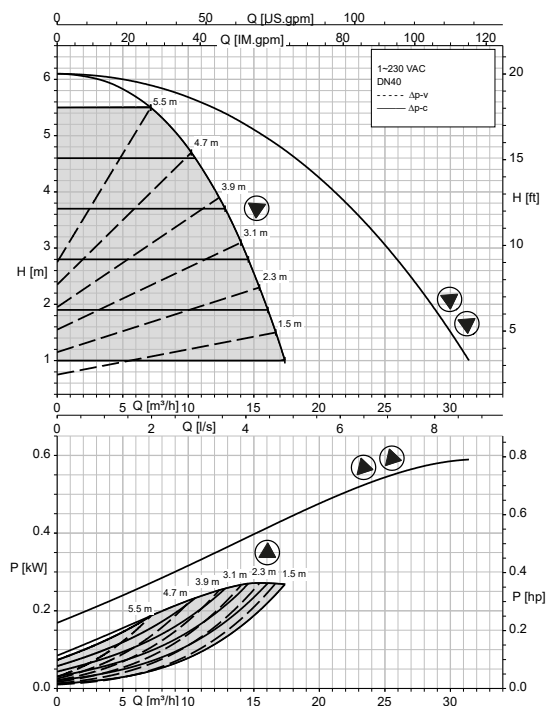
Calio Pro Plus Z 40-40 Δp_v , Δp_c



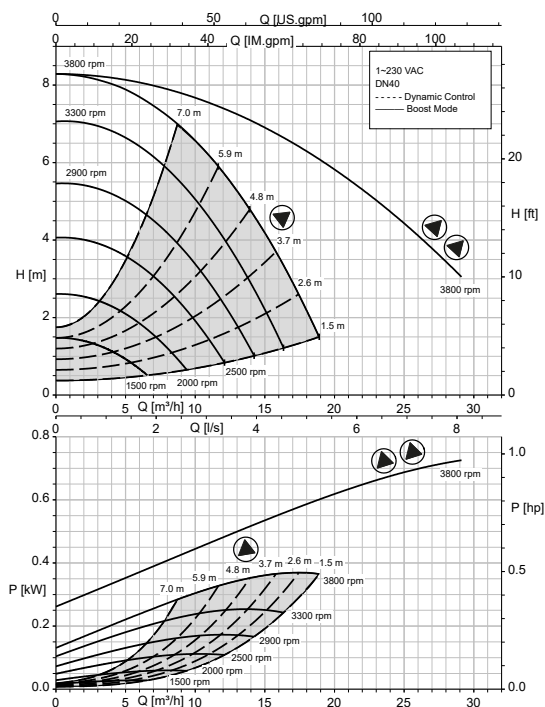
Calio Pro Plus Z 40-60 Open-loop Control, Dynamic Control



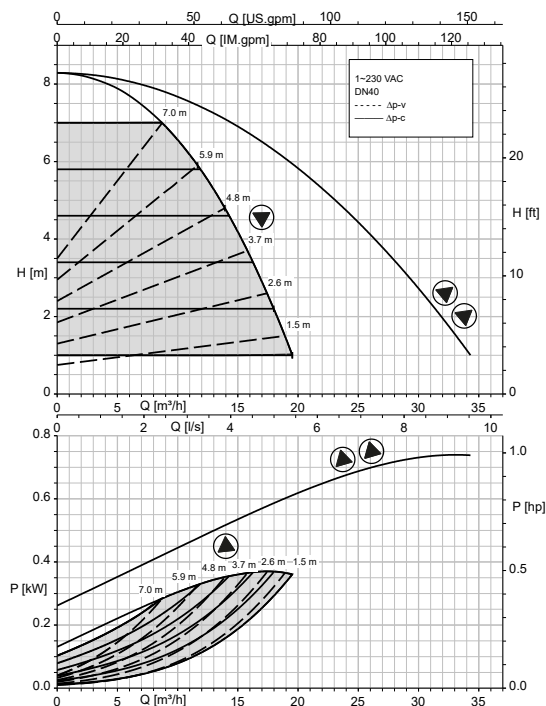
Calio Pro Plus Z 40-60 Δp_v , Δp_c



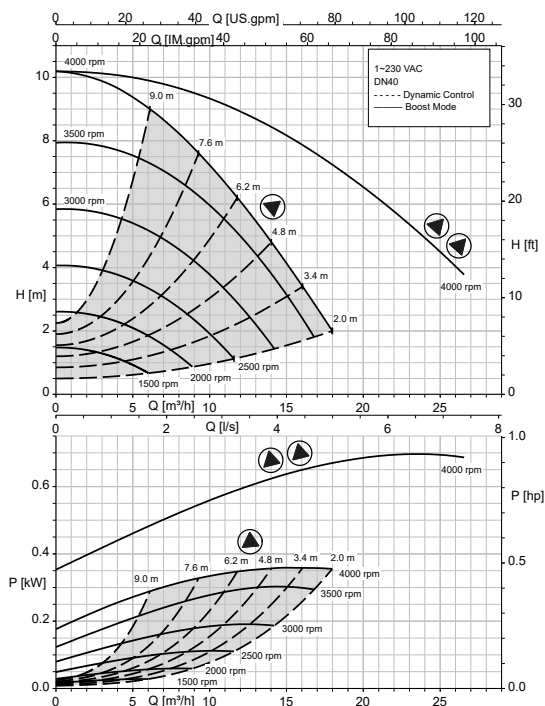
Calio Pro Plus Z 40-80 Open-loop Control, Dynamic Control



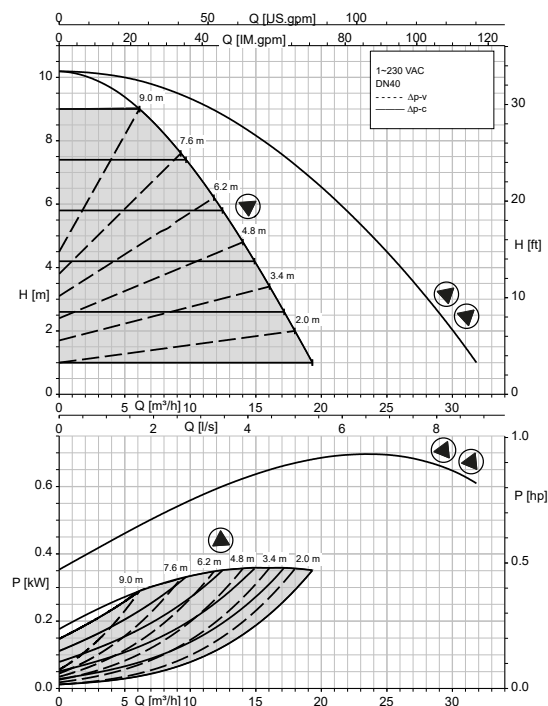
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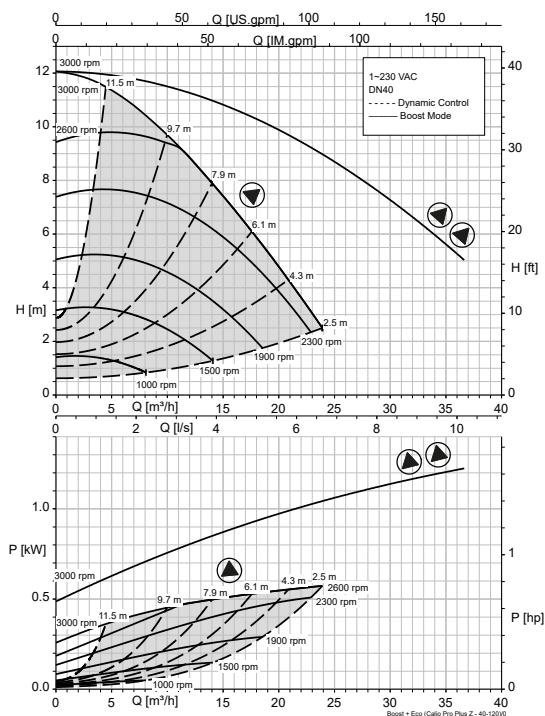
Calio Pro Plus Z 40-100 Open-loop Control, Dynamic Control



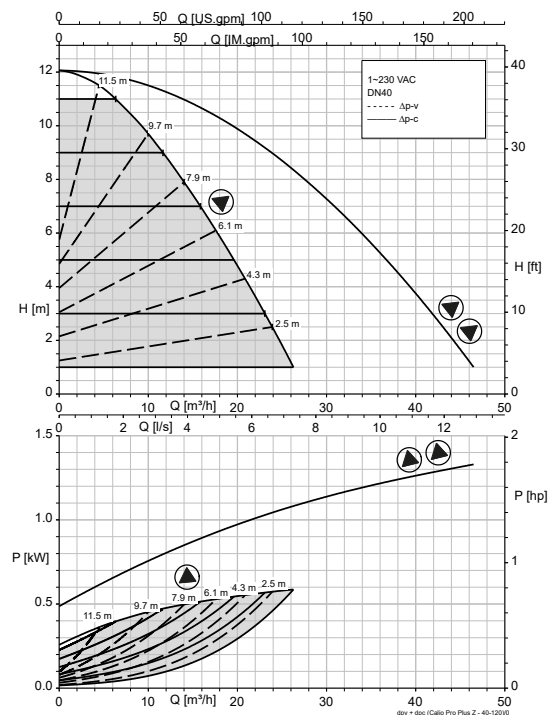
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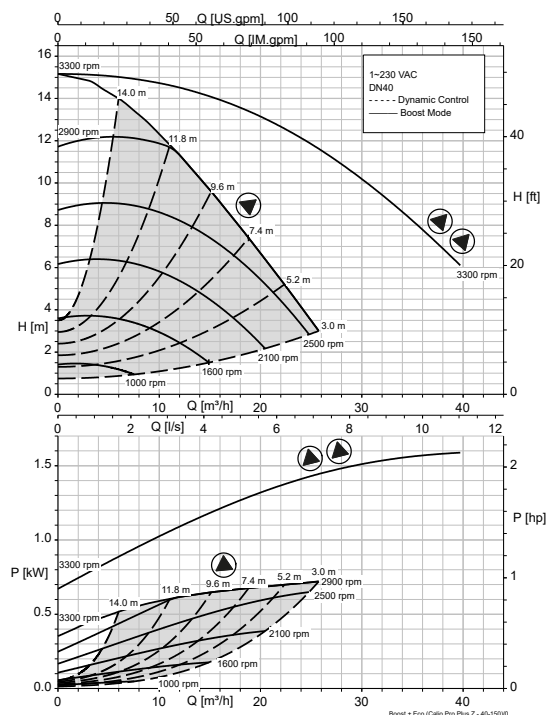
Calio Pro Plus Z 40-120 Open-loop Control, Dynamic Control



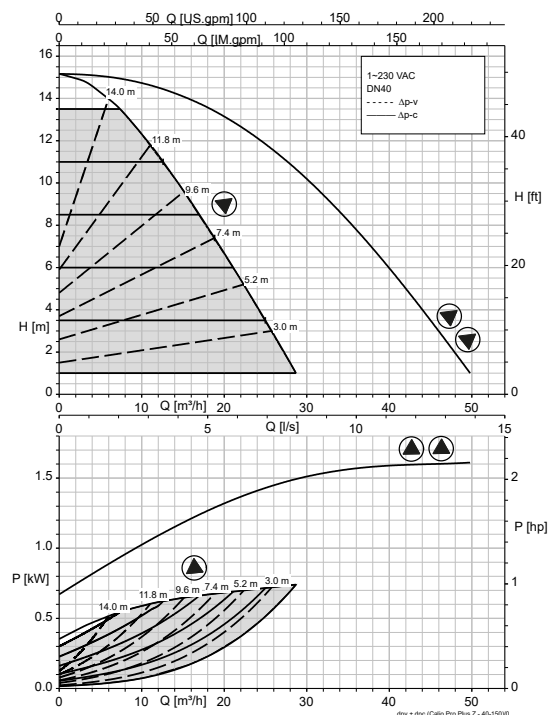
Calio Pro Plus Z 40-120 Δp_v , Δp_c



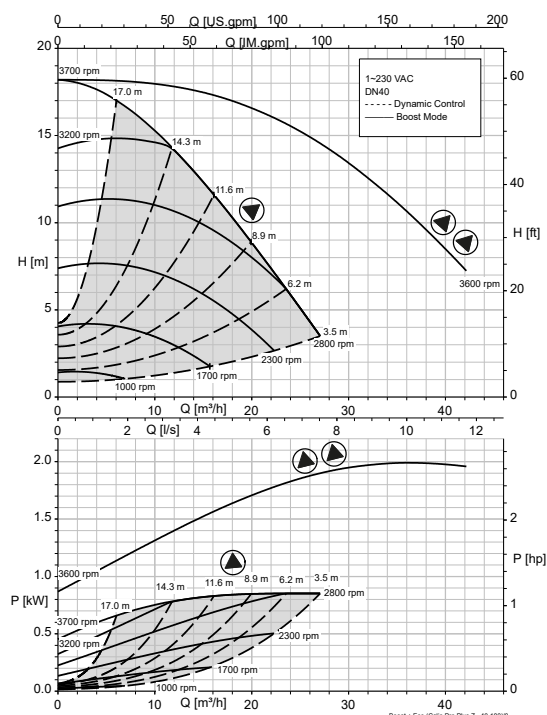
Calio Pro Plus Z 40-150 Open-loop Control, Dynamic Control



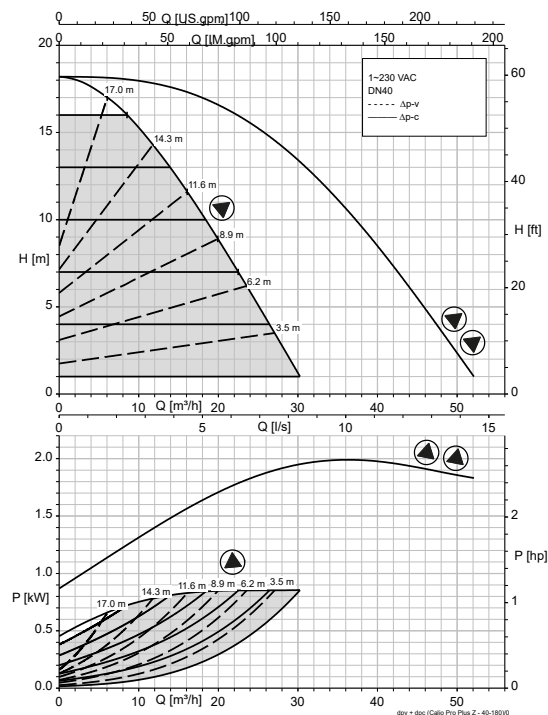
Calio Pro Plus Z 40-150 Δp_v , Δp_c



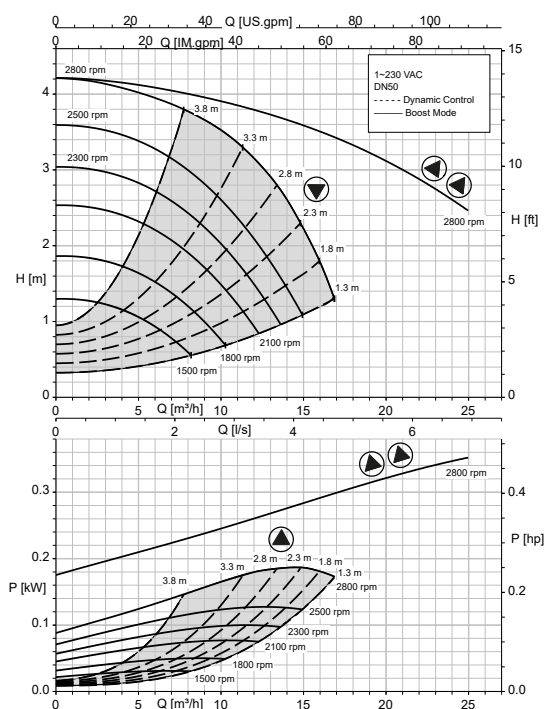
Calio Pro Plus Z 40-180 Open-loop Control, Dynamic Control



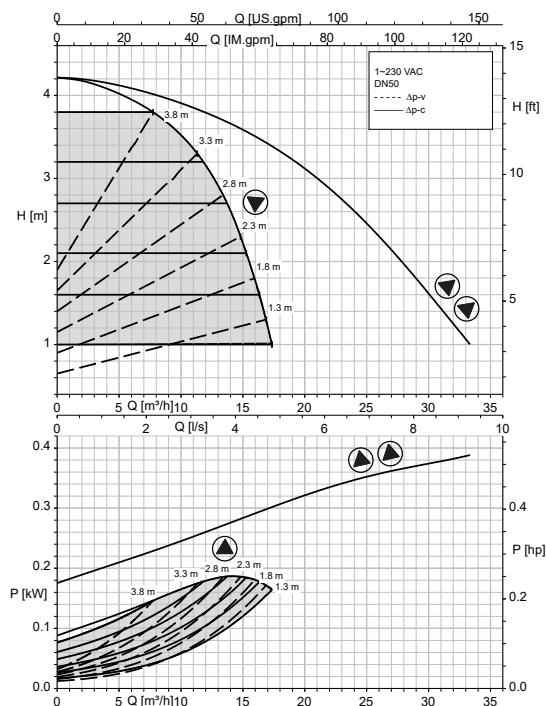
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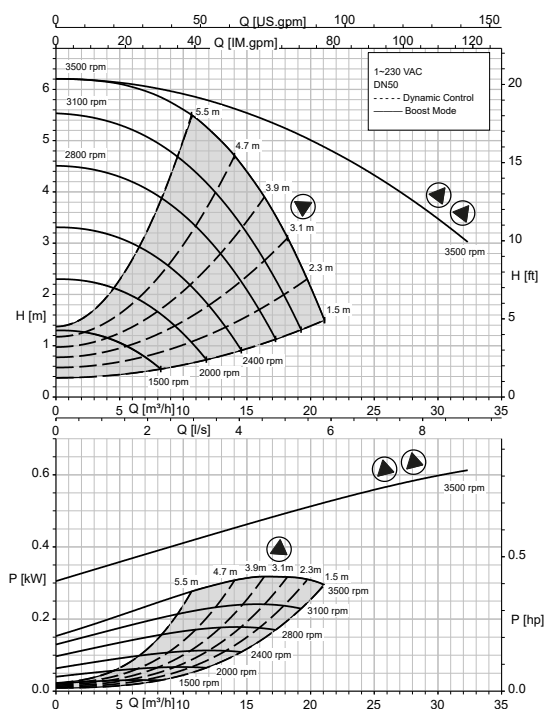
Calio Pro Plus Z 50-40 Open-loop Control, Dynamic Control



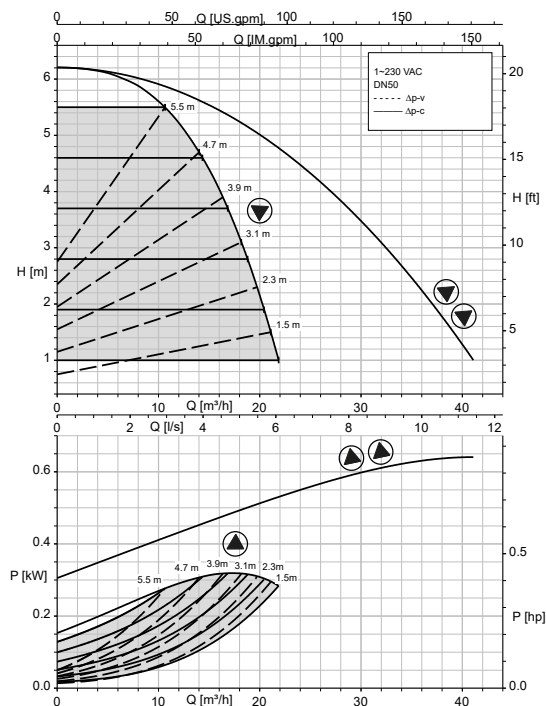
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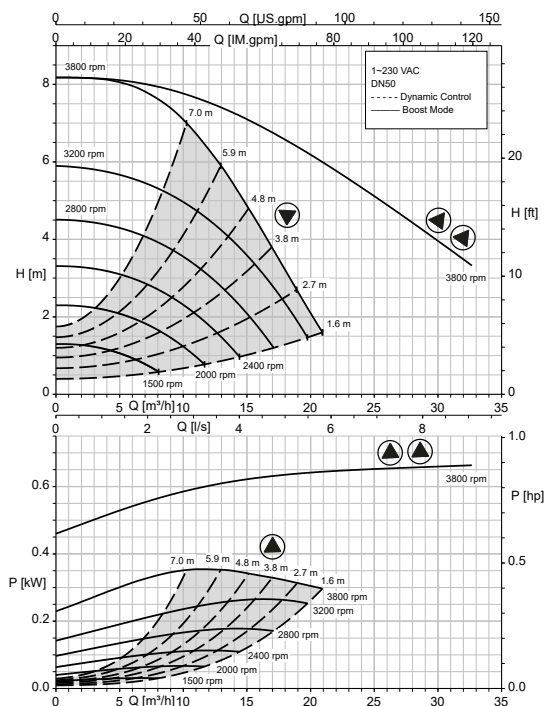
Calio Pro Plus Z 50-60 Open-loop Control, Dynamic Control



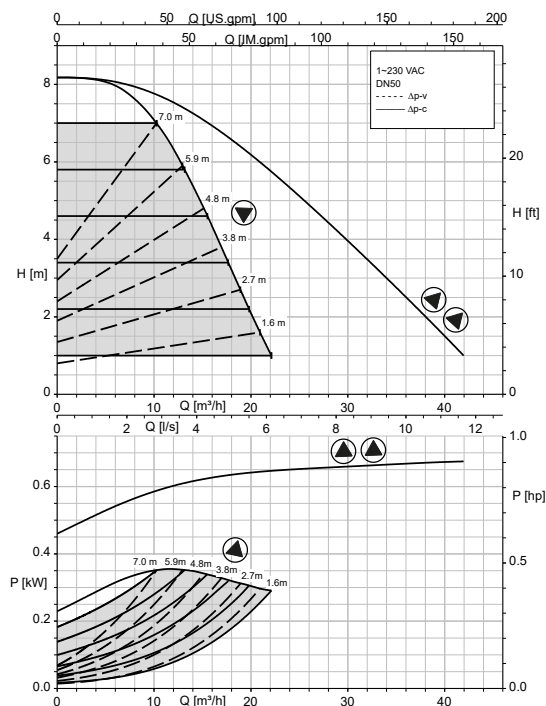
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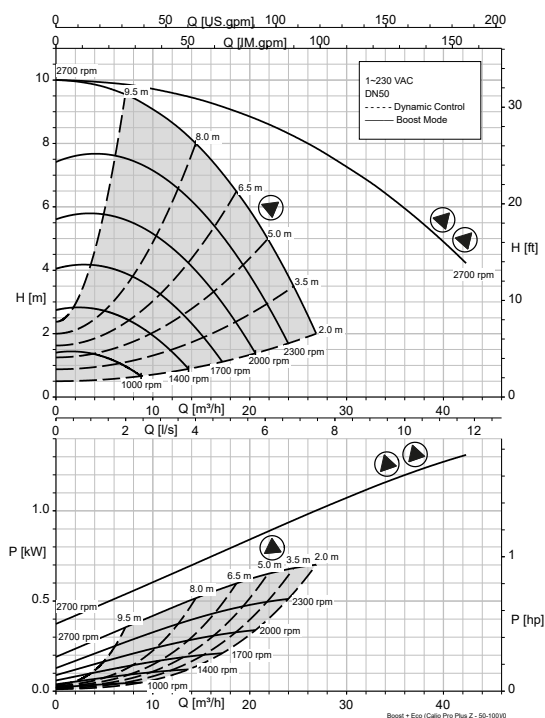
Calio Pro Plus Z 50-80 Open-loop Control, Dynamic Control



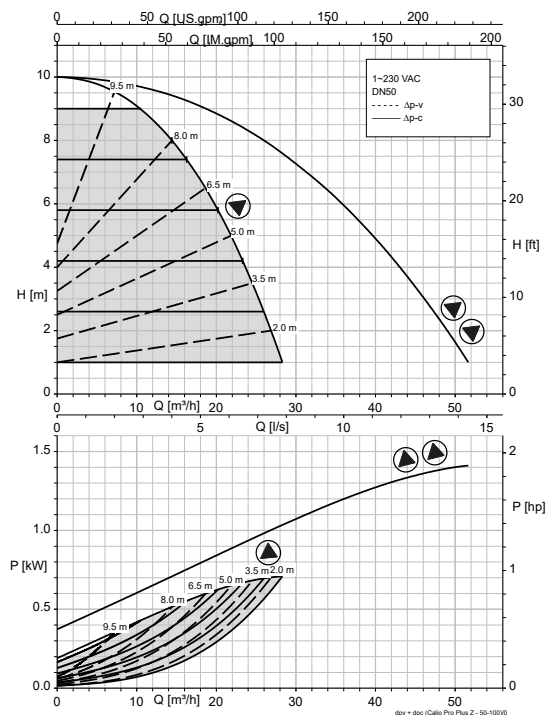
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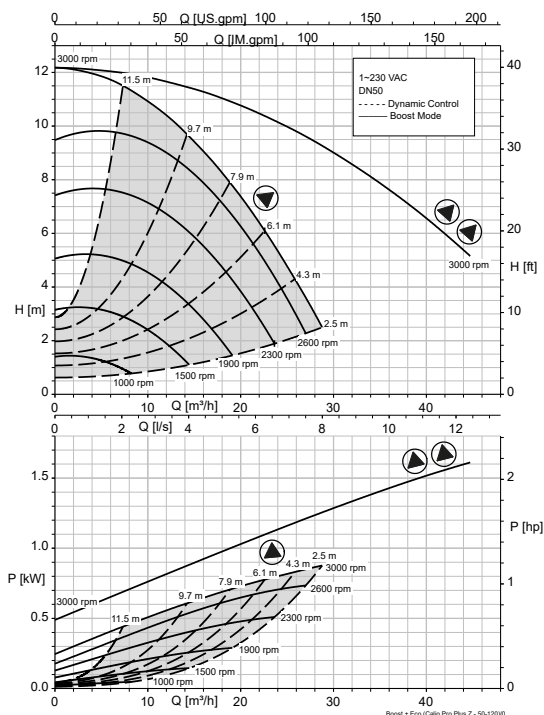
Calio Pro Plus Z 50-100 Open-loop Control, Dynamic Control



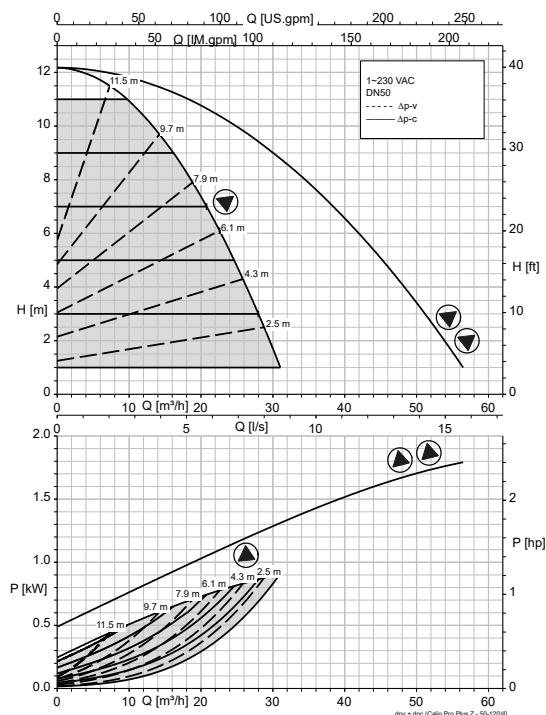
Calio Pro Plus Z 50-100 Δp_v , Δp_c



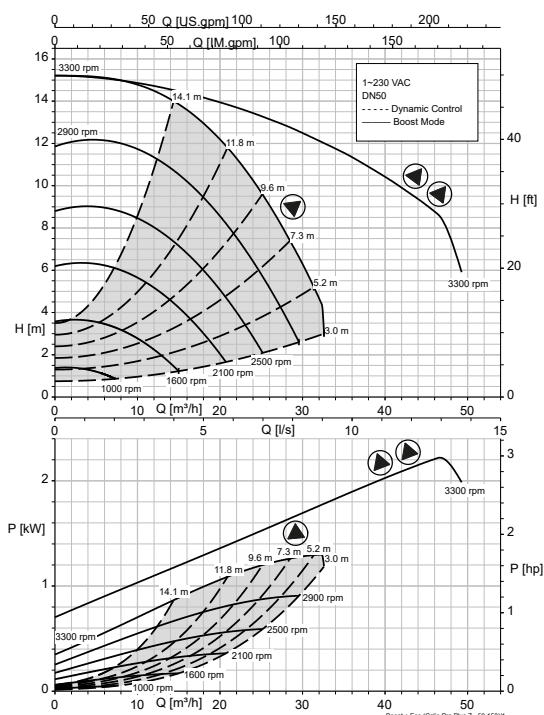
Calio Pro Plus Z 50-120 Open-loop Control, Dynamic Control



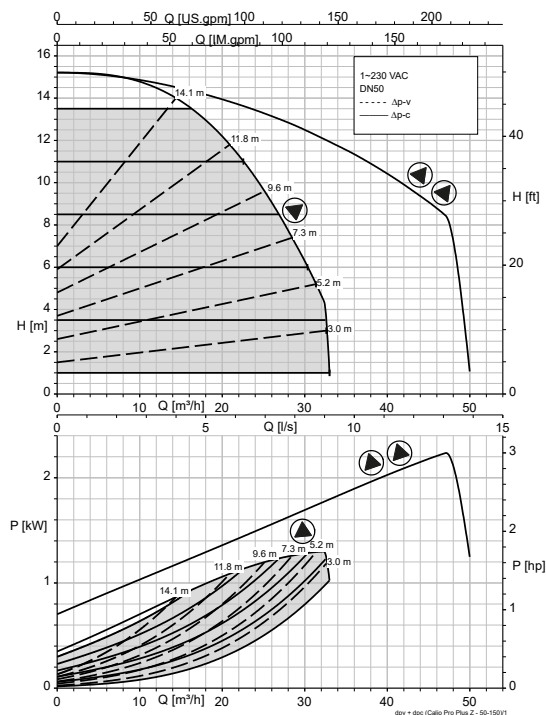
Calio Pro Plus Z 50-120 Δp_v , Δp_c



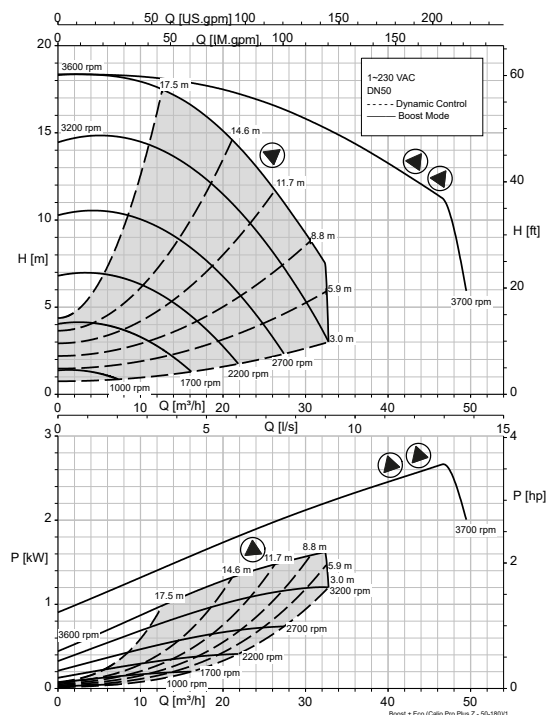
Calio Pro Plus Z 50-150 Open-loop control, Dynamic Control



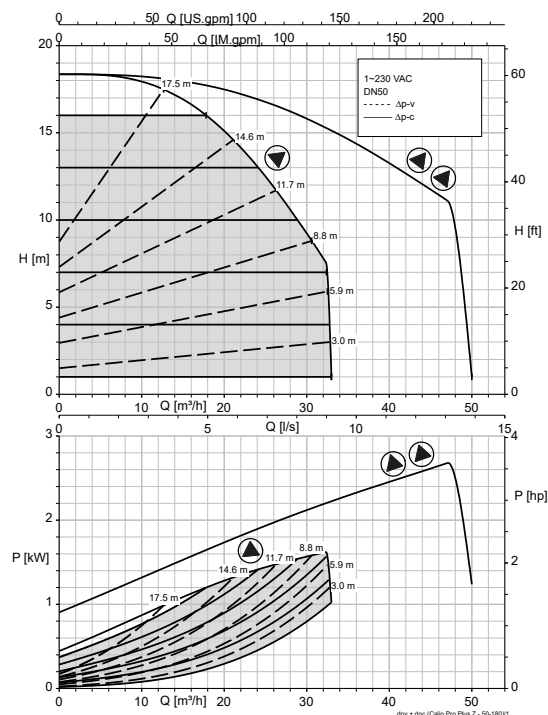
Calio Pro Plus Z 50-150 Δp_v , Δp_c



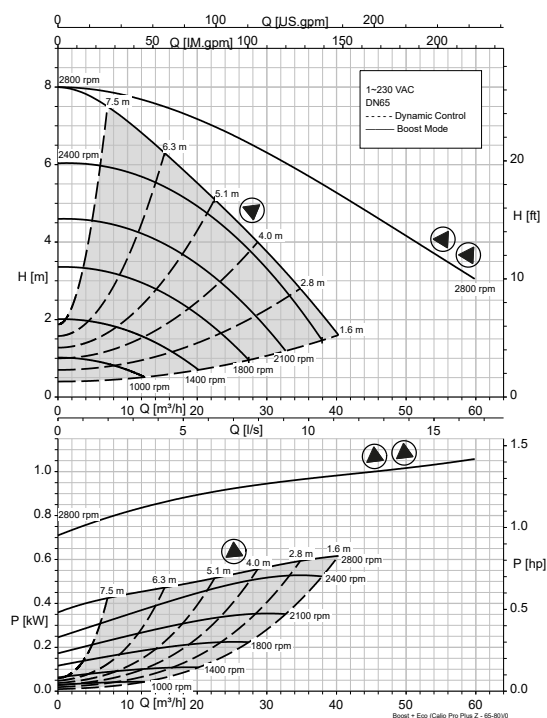
Calio Pro Plus Z 50-180 Open-loop control, Dynamic Control



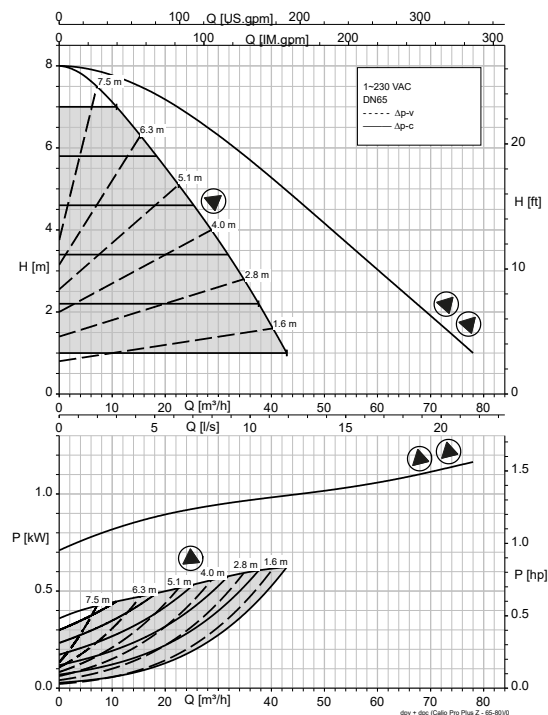
Calio Pro Plus Z 50-180 Δp_v , Δp_c



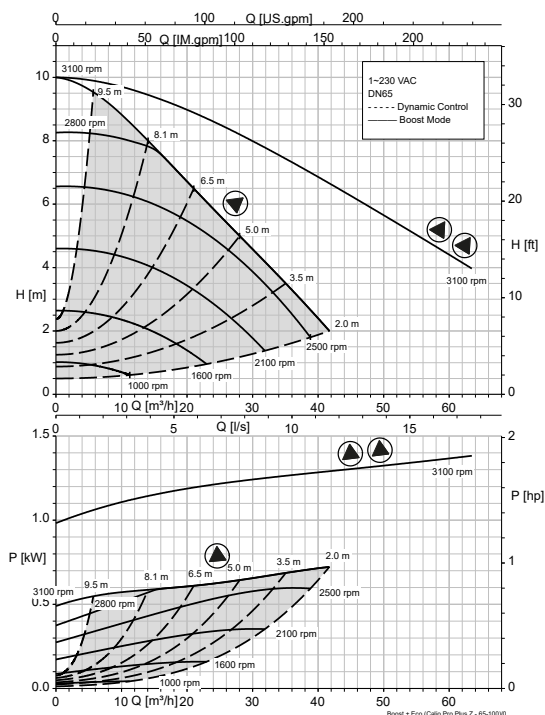
Calio Pro Plus Z 65-80 Open-loop Control, Dynamic Control



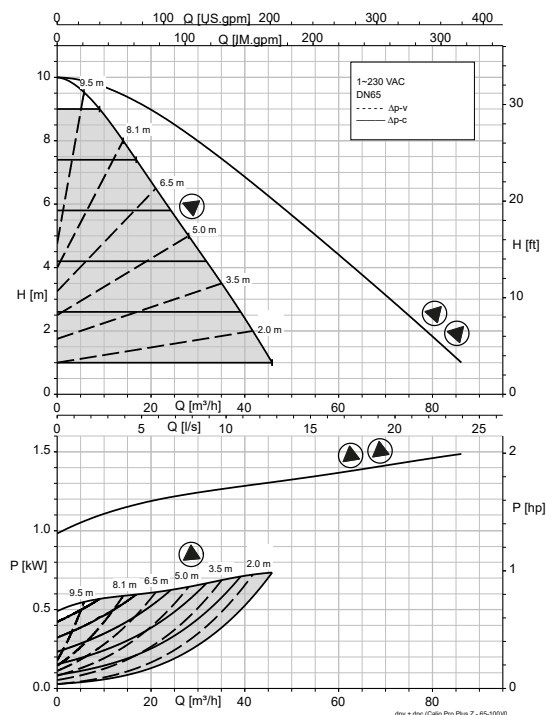
Calio Pro Plus Z 65-80 Δp_v , Δp_c



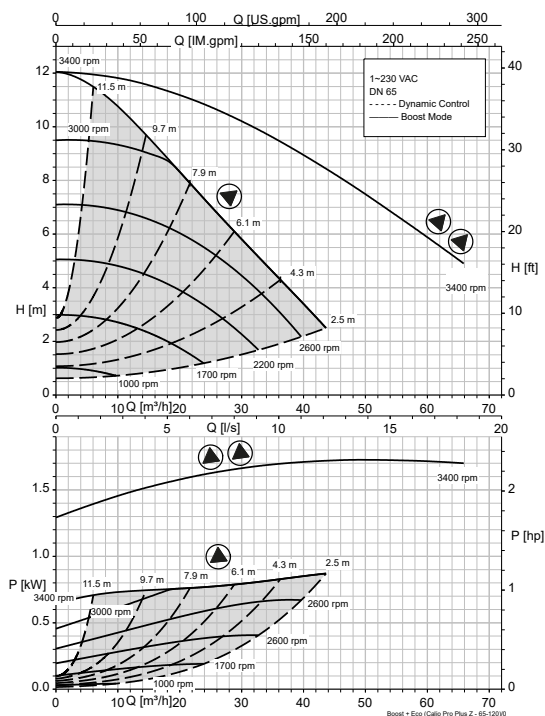
Calio Pro Plus Z 65-100 Open-loop Control, Dynamic Control



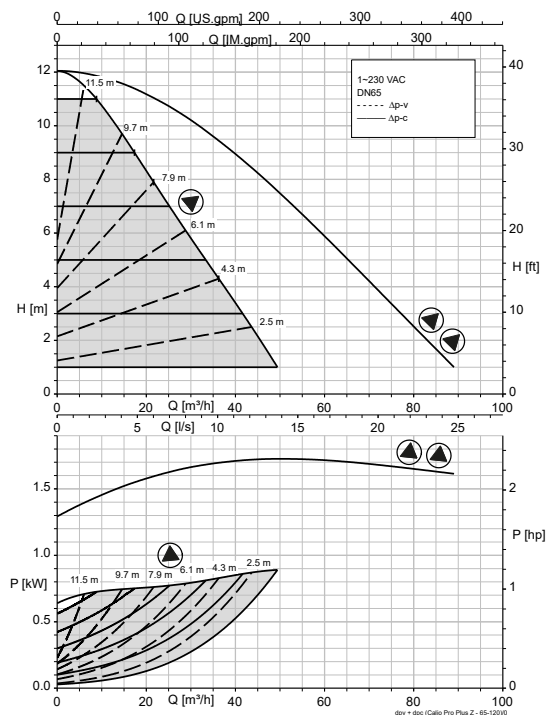
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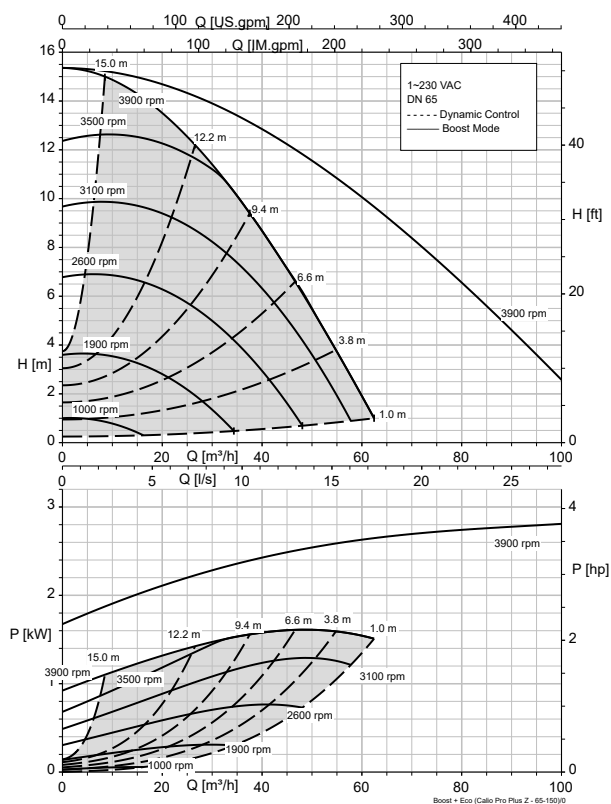
Calio Pro Plus Z 65-120 Open-loop Control, Dynamic Control



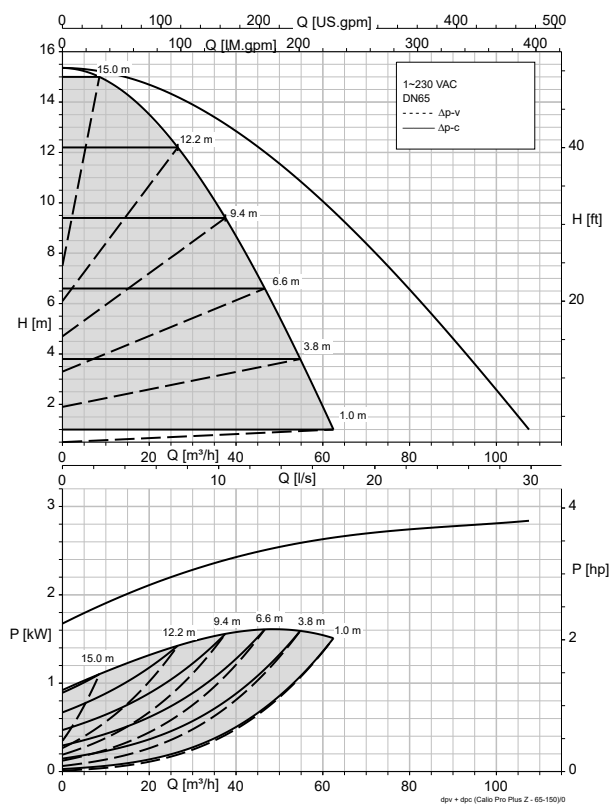
Calio Pro Plus Z 65-120 Δp_v , Δp_c



Calio Pro Plus Z 65-150 Open-loop Control, Dynamic Control



Calio Pro Plus Z 65-150 Δp_v , Δp_c



Dimensions

Pump set dimensions

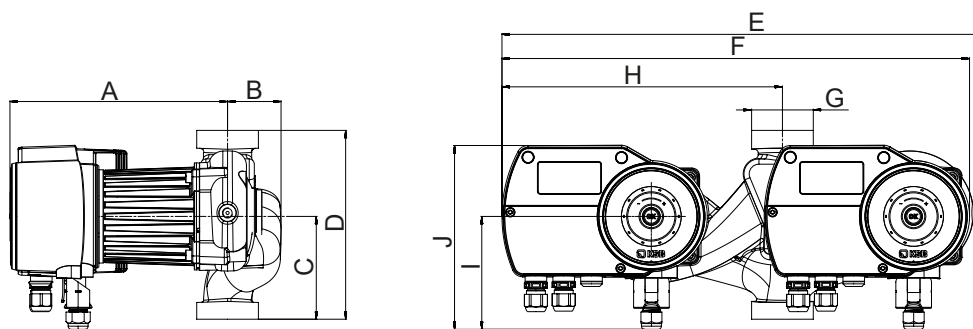


Fig. 3: Screw-ended pump set

Table 10: Dimensions of screw-ended pump set

Size	Connection		A	B	C	D	E ⁸⁾	F	H	I	J
	Piping	Pump	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
30-40	R 1 1/4 ⁹⁾	G 2	209	51	82	180	470	446	268	108	175
30-60	R 1 1/4 ⁹⁾	G 2	209	51	82	180	470	446	268	108	175
30-80	R 1 1/4 ⁹⁾	G 2	209	51	82	180	470	446	268	108	175
30-100	R 1 1/4 ⁹⁾	G 2	209	51	82	180	470	446	268	108	175
30-120	R 1 1/4 ⁹⁾	G 2	209	51	82	180	470	446	268	108	175

⁸ If the pump is in a horizontal installation position and the vent plug (if applicable) is fitted, dimension E increases by 30 mm.

⁹ Connection using pump pipe unions (accessories)

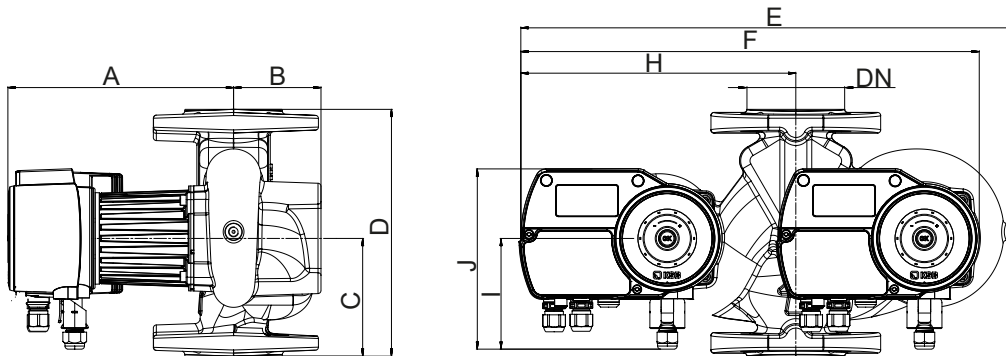


Fig. 4: Flanged pump set ($P_1 \leq 400$ W)

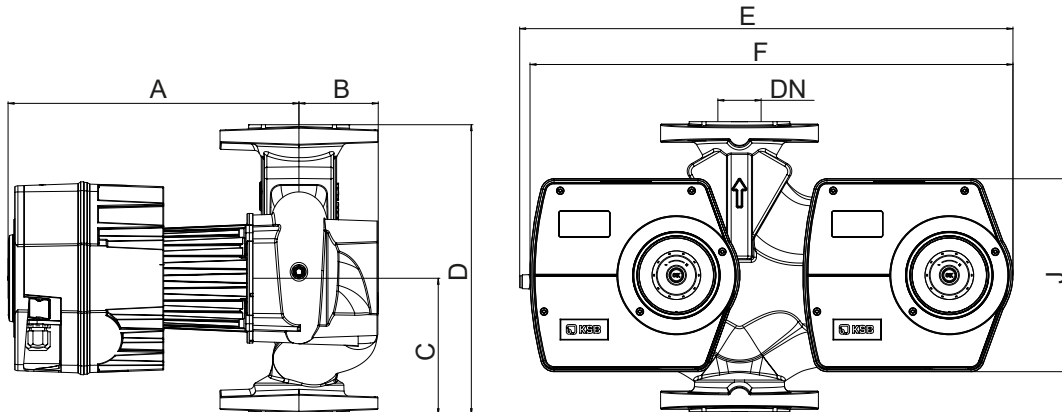


Fig. 5: Flanged pump set ($P_1 > 400$ W)

Table 11: Dimensions of flanged pump set

Size	Connection		A	B	C	D	E ⁸⁾	F	H	I	J
	Piping	Pump	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Flanged pump set ($P_1 \leq 400$ W)											
32-40	DN 32	DN 32	209	70	110	220	470	446	268	108	175
32-60	DN 32	DN 32	209	70	110	220	470	446	268	108	175
32-80	DN 32	DN 32	209	70	110	220	470	446	268	108	175
32-100	DN 32	DN 32	209	70	110	220	470	446	268	108	175
32-120	DN 32	DN 32	209	70	110	220	470	446	268	108	175
32-150	DN 32	DN 32	209	70	110	220	470	446	268	108	175
40-40	DN 40	DN 40	216	75	121	220	470	446	268	108	175
40-60	DN 40	DN 40	216	75	121	220	470	446	268	108	175
40-80	DN 40	DN 40	216	75	121	220	470	446	268	108	175
40-100	DN 40	DN 40	216	75	121	220	470	446	268	108	175
50-40	DN 50	DN 50	221	85	126	240	490	446	268	108	175
50-60	DN 50	DN 50	221	85	126	240	490	446	268	108	175
50-80	DN 50	DN 50	221	85	126	240	490	446	268	108	175
Flanged pump set ($P_1 > 400$ W)											
40-120	DN 40	DN 40	338	77	148	250	567	567	-	-	226
40-150	DN 40	DN 40	338	77	148	250	567	567	-	-	226
40-180	DN 40	DN 40	338	77	148	250	567	567	-	-	226
50-100	DN 50	DN 50	337	83	140	280	567	567	-	-	226
50-120	DN 50	DN 50	337	83	140	280	567	567	-	-	226
50-150	DN 50	DN 50	337	83	140	280	567	567	-	-	226
50-180	DN 50	DN 50	337	83	140	280	567	567	-	-	226
65-80	DN 65	DN 65	341	93	160	340	579	567	-	-	226
65-100	DN 65	DN 65	341	93	160	340	579	567	-	-	226
65-120	DN 65	DN 65	341	93	160	340	579	567	-	-	226
65-150	DN 65	DN 65	341	93	160	340	579	567	-	-	226

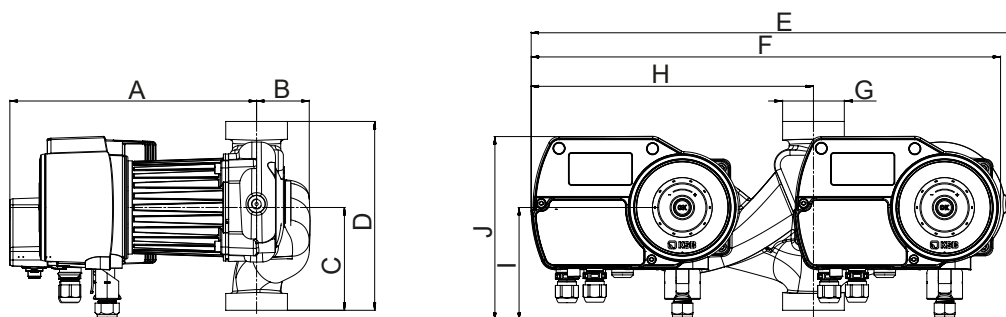


Fig. 6: Screw-ended pump set with field bus module (accessory)

Table 12: Dimensions of screw-ended pump set with field bus module (accessory)

Size	Connection		A	B	C	D	E ⁸⁾	F	H	I	J
	Piping	Pump	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
30-40	R 1 1/4 ⁹⁾	G 2	236	51	82	180	472	448	270	108	175
30-60	R 1 1/4 ⁹⁾	G 2	236	51	82	180	472	448	270	108	175
30-80	R 1 1/4 ⁹⁾	G 2	236	51	82	180	472	448	270	108	175
30-100	R 1 1/4 ⁹⁾	G 2	236	51	82	180	472	448	270	108	175
30-120	R 1 1/4 ⁹⁾	G 2	236	51	82	180	472	448	270	108	175

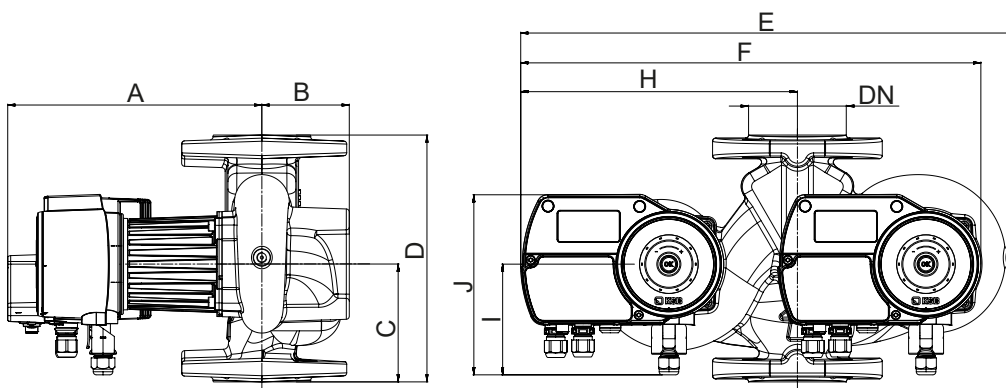


Fig. 7: Flanged pump set with field bus module (accessory)

Table 13: Dimensions of flanged pump set with field bus module (accessory)

Size	Connection		A	B	C	D	E ⁸⁾	F	H	I	J
	Piping	Pump	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
32-40	DN 32	DN 32	236	70	110	220	472	448	270	108	175
32-60	DN 32	DN 32	236	70	110	220	472	448	270	108	175
32-80	DN 32	DN 32	236	70	110	220	472	448	270	108	175
32-100	DN 32	DN 32	236	70	110	220	472	448	270	108	175
32-120	DN 32	DN 32	236	70	110	220	472	448	270	108	175
32-150	DN 32	DN 32	236	70	110	220	472	448	270	108	175
40-40	DN 40	DN 40	243	75	121	220	472	448	270	108	175
40-60	DN 40	DN 40	243	75	121	220	472	448	270	108	175
40-80	DN 40	DN 40	243	75	121	220	472	448	270	108	175
40-100	DN 40	DN 40	243	75	121	220	472	448	270	108	175
50-40	DN 50	DN 50	248	85	126	240	492	448	270	108	175
50-60	DN 50	DN 50	248	85	126	240	492	448	270	108	175
50-80	DN 50	DN 50	248	85	126	240	492	448	270	108	175

Flange dimensions

Table 14: Flange dimensions

Size	PN 6			PN 10, PN 16			Outline drawing
	$\varnothing D$	$\varnothing k$	$n \times \varnothing d_2$	$\varnothing D$	$\varnothing k$	$n \times \varnothing d_2$	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
DN 32	120	90	$4 \times \varnothing 14$	140	100	$4 \times \varnothing 19$	
DN 40	130	100	$4 \times \varnothing 14$	150	110	$4 \times \varnothing 19$	
DN 50	140	110	$4 \times \varnothing 14$	165	125	$4 \times \varnothing 19$	

Installation information

Permissible installation positions

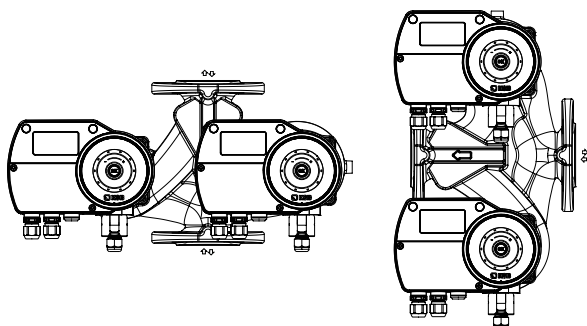


Fig. 8: Permissible installation positions

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump set
- Sealing elements
- Electrical plug-type connector (only for pump sets with $P_1 \leq 400 \text{ W}$)
- Washers (only for flanged pump sets of DN 32 to DN 65)
- Installation/operating manual
- Pre-configured dual connection cable
- Vent plug

Accessories

Pipe unions

Table 15: Pipe unions

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

Spacers (flange)

Table 16: Spacers (flange)

	Description	Connection	PN	Length	Mat. No.	[kg]
				[mm]		
	Spacer F16	DN 40	6/10/16	30	19075991	2
	Spacer F0	DN 40	6/10/16	70	19075566	2
	Spacer F1	DN 50	6/10/16	10	19075567	2
	Spacer F2	DN 50	6/10/16	20	19075568	2
	Spacer F3	DN 50	6/10/16	50	19075569	2
	Spacer F4	DN 50	6/10/16	60	19075570	2
	Spacer F5	DN 65	6/10/16	10	19075571	2
	Spacer F6	DN 65	6/10/16	25	19075572	2
	Spacer F7	DN 65	6/10/16	30	19075573	2

Electrical accessories
Table 17: Electrical accessories

	Description	Connection	Electric cable length	Measuring range	Mat. No.	[kg]
			[m]	[°C]		
	Resistance thermometer (cable sensor) Pt1000, 6 x 50 x 3000	DN 25 - 80	3,00	-50 - +180	05360148	0.1
	Resistance thermometer (cable sensor) Pt1000, 6 x 50 x 5000	DN 25 - 80	5,00		05360149	0.18
	Resistance thermometer (cable sensor) Pt1000, 6 x 50 x 10000	DN 25 - 80	10,00		05360230	0.29
	Resistance thermometer (cable sensor) Pt1000, 6 x 100 x 3000	100 - 200	3,00		05360231	0.12
	Resistance thermometer (cable sensor) Pt1000, 6 x 100 x 5000	100 - 200	5,00		05360232	0.19
	Resistance thermometer (cable sensor) Pt1000, 6 x 100 x 10000	DN 100 - 200	10,00		05360233	0.35
	Protective well G 1/2, hex. WAF 22 x 50	DN 25 - 80	-	-	05360237	0.08
	Protective well G 1/2, hex. WAF 22 x 100	100 - 200	-	-	05360238	0.09
	M12 connector for self-assembly for BACnet 1 x connector, B-coded, 5-pole Push-lock spring-type connection, shielded/shieldable, connection cross-section 0.75 mm² maximum (AWG 20 max.) Cable passage 4-8 mm Enclosure IP67	-	-	-	05265994	0.1
	M12 socket for self-assembly for BACnet 1 x socket, B-coded, 5-pole Push-lock spring-type connection, shielded/shieldable, connection cross-section 0.75 mm² maximum (AWG 20 max.) Cable passage 4-8 mm Enclosure IP67	-	-	-	05265993	0.1
	Bus cable for CAN, BACnet and Modbus	-	1	-	01111184	0.2
	Cut to length for self-assembly, shielded, twisted pair, cable 2 x 2 x 0.22 mm²	-	5	-	01304511	0.4
		-	10	-	01304512	0.7
		-	20	-	01304513	1.4

	Description	Connection	Electric cable length	Measuring range	Mat. No.	[kg]
			[m]	[°C]		
	M12 terminating resistor for the BACnet MS/TP communication module Connector, B-coded The terminating resistor is designed to plug into the free M12 socket on the BACnet MS/TP communication module.	-	-	-	01125102	0.01
	BACnet MS/TP communication module for pump sets with P1 ≤ 400 W For connecting the pump set to BACnet MS/TP networks Monitoring, open-loop and closed-loop control of the pump set in single-pump operation and dual-pump operation (in dual-pump operation one module is sufficient for the pump system) Suitable for the following sizes: 25-xx, 30-xx, 32-xx, up to 40-100, up to 50-80, up to 65-60	-	-	-	05458730	0.18
	BACnet MS/TP communication module for pump sets with P1 > 400 W For connecting the pump set to BACnet MS/TP networks Monitoring, open-loop and closed-loop control of the pump set in single-pump operation and dual-pump operation (in dual-pump operation one module is sufficient for the pump system) Suitable for the following sizes: from 40-120, from 50-100, from 65-80, 80-xx, 100-xx	-	-	-	05604687	0.06



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