

The iQ-motor

Quadratic. Practical. [Intelligent.](#)

	Technical data	34
	iQ savings potential	37
	Air performance curves	38



Same on the outside – better on the inside!

Typical of ebm-papst: we have taken a standard motor and a principle that for decades has enjoyed success in countless applications and made it more intelligent, energy-efficient and environmentally friendly! Features of the shaded-pole motor (Q-motor) such as outstanding running smoothness, low maintenance and a long service life have made asynchronous motors a standard component in small fans. Our objective was to significantly improve the inner mechanism of the Q-motor by incorporating EC technology – while keeping the exterior design identical. Conventional Q-motors can now be replaced with the new “iQ”-motors if the fans fail or if a more energy-efficient solution is required.

Exchange your old motor for 70 % more efficiency

During the development of the iQ-motor, our engineers took giant strides towards reducing energy costs and fulfilling environmental protection requirements. By integrating ebm-papst EC technology, new iQ-motor now features far better efficiency and pays for itself quickly due to its significant energy-savings.

The best part of all: from the outside, it is the same old fan. The identical dimensions and mounting options enable simple replacement without changes, structural modifications or any other extra effort. Axial impellers with diameters of 154 to 254 mm can be installed on the new iQ-motor just as before. The same applies to the mounting flange, the wall ring and the guard grille. Therefore, thousands of applications can easily be made more energy-efficient as part of routine maintenance, and may benefit at once from a drastic increase in efficiency, without any development effort.

The best equipment – not just in an emergency

Of course, the enormous increase in energy efficiency is not the only feature we have packed into the intelligent motor. Important electronic features ensure that the iQ-motor works even more “conscientiously” than its simple counterpart. For example, the motor has a closed loop speed control that keeps it at the same speed at all times, regardless of the diameter of the installed blade. With dirt or other interference factors, they do not cause an overload of the motor. The iQ-motor continues working at reduced speed.

One design – thousands of applications

Just one design is compatible with the entire range of impellers, from 154 to 254 mm. This makes logistics easier and keeps your development effort low. Moreover, the smallest size, the iQ 3608, is the most compact version of an EC motor for its field of application in refrigeration. It has an axial installation depth of only 74 mm, thus guaranteeing the necessary little bit of air in very tight installation spaces.

Energy-saving and quiet – throughout its long service

All variants share the low-noise performance and the famous long service life that have made this motor type so popular for so long. A critical role is played by a particularly low-friction bearing system with double ball bearings. Thus the iQ-motor can continue to yield its enormous savings potential for a very, very long time after only a brief amortisation phase. Available options include the IP 54 type of protection and, of course, a standards-compliant TÜV approval.

iQ-motor

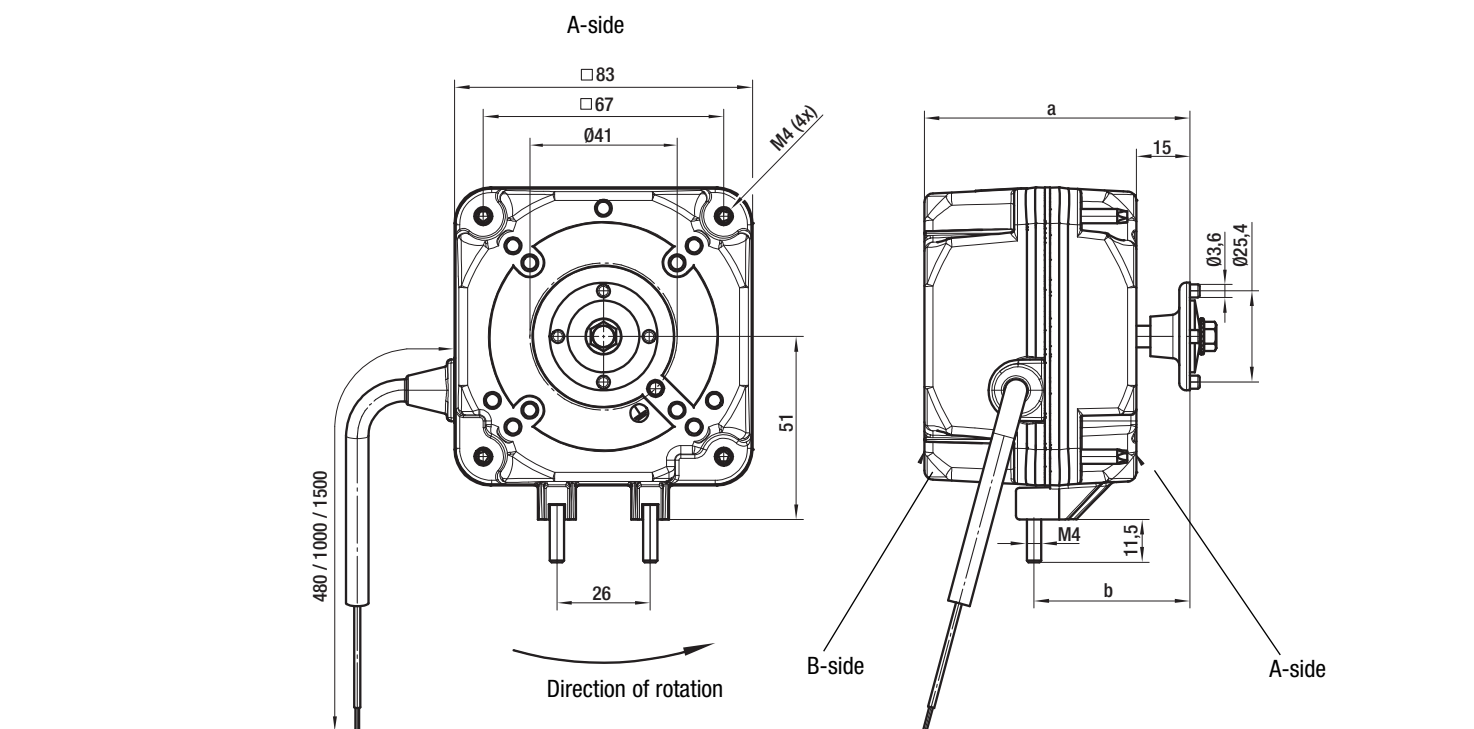


- **Material:**
Housing: Die-cast aluminium
- **Direction of air flow:** "V" and "A"
(depending on axial impeller used)
- **Direction of rotation:** Counterclockwise,
seen on shaft end
- **Type of protection:** IP 42 (only with
horizontal shaft), optional IP 54 (any shaft
position)
- **Insulation class:** "H"
- **Mounting position:** Any
- **Mode of operation:** Con. operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Via electronics
- **Electrical connection:** Mains cable
- **Protection class:** I
- **Approvals:** TÜV; UL (in progress)
- **Mounting attachment parts:**
Guard grille and wall ring are attached to
the projecting thread ends on the A side
- **Axial impeller attachment:**
A plastic adapter with catching peg and
M4 screw is used to secure the impeller
on the motor shaft

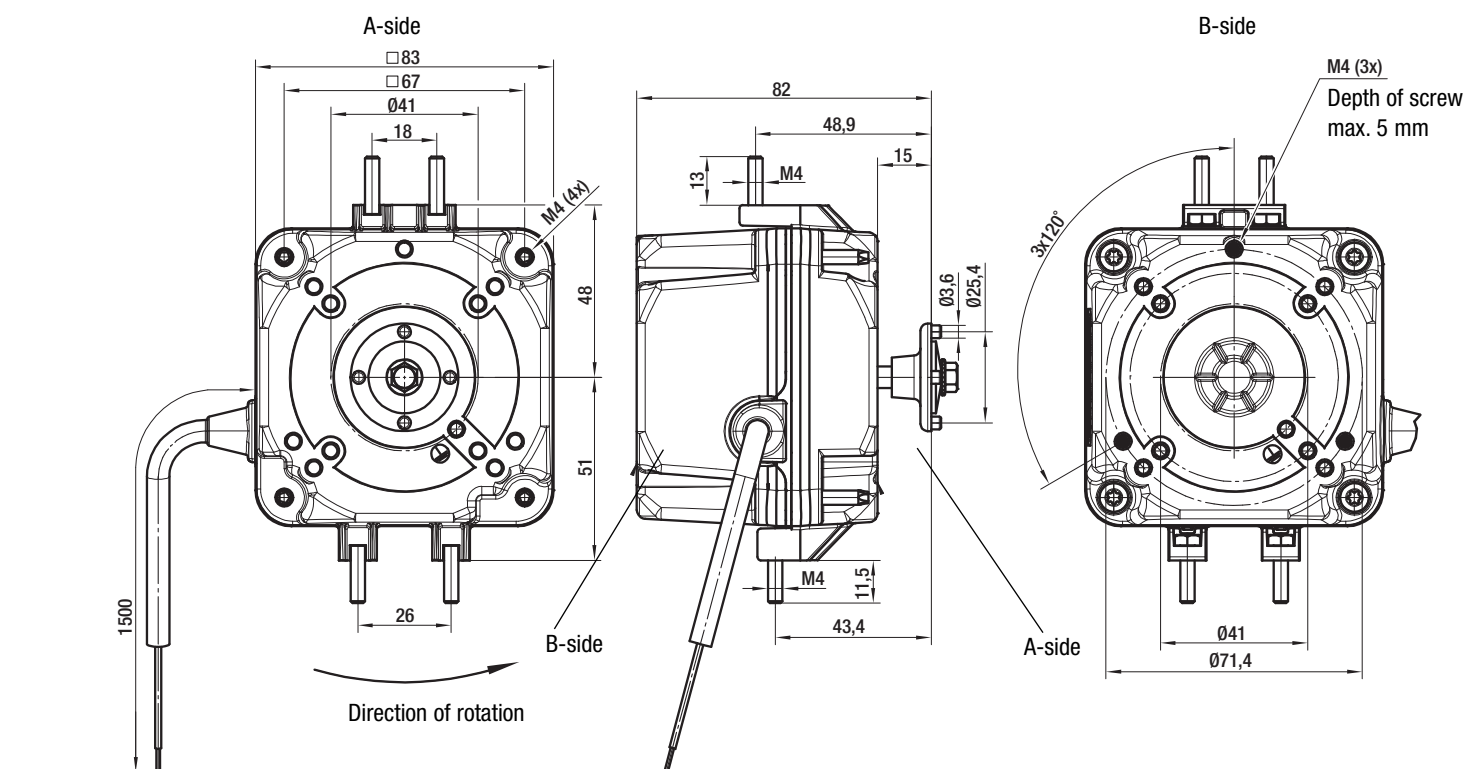
Nominal data		Nominal voltage	Frequency	Speed/rpm	Output capacity	Perm. amb. temp.	Mass	Dimensions	
Type		V	Hz	rpm	W	°C	kg	a	b
iQ 3608		220-240 115	50/60 50/60	1300 1550	3 3	-40..+50 -40..+50	0,5	74	43,5
iQ 3612		220-240 115	50/60 50/60	1300 1550	10 10	-40..+50 -40..+50	0,6	82	43,5
iQ 3620		220-240 115	50/60 50/60	1300 1550	20 20	-40..+50 -40..+50	0,8	90	51,5

subject to alterations

Standard design



Multi-function design (only iQ 3612)



iQ-motor – combination with axial impellers

Power input and air flow



- **Power ratings (220 - 240 V design):** Power input and air flow at 230 V / 50 Hz and a constant speed of 1300 min⁻¹.

Motor	Axial impeller diameter	Axial impeller blade angle	Curves	Max. power input	Power input running at free air	Air flow running at free air at n=1300 rpm
iQ 3608	mm	°		W	W	m³/h
	154	22	A	2,8	2,5	150
	154	28		3,2	3	190
	154	34		3,7	3,5	210
	172	22	B	5,3	3	240
	172	28		6,7	4,1	270
	172	34		7,5	5,5	300
	200	22	C	7,5	5	350
	200	28		7,5	6	400
iQ 3612	mm	°		W	W	m³/h
	200	22	D	9,5	4,4	350
	200	28		11	5,3	400
	200	34		15	7,8	460
	230	22	E	23	9,5	520
	230	28		21,5	15,5	720
	230	34		23	19,5	750
	254	22	F	23	15	700
	254 *	28		23	23	950
iQ 3620	mm	°		W	W	m³/h
	254	22	G	26	11,8	700
	254	28		30	18,3	950
	254	34		31	26,8	1000
	300	22	H	32	27,5	1400

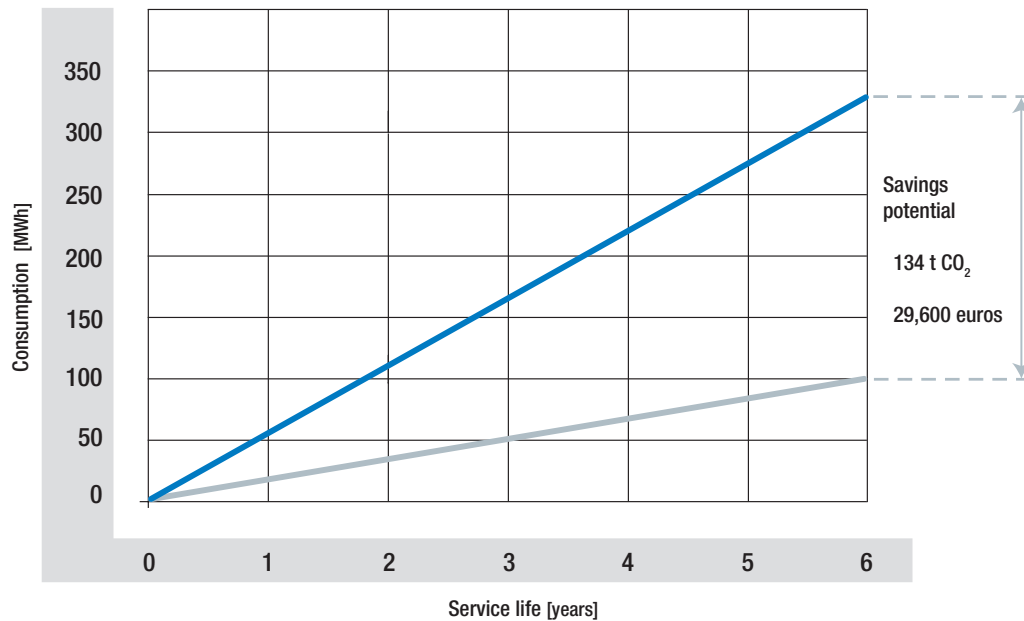
subject to alterations

* Depending on back pressure, full nominal speed of 1300 min⁻¹ is not reached to some part. Depending on mounting situation, a speed of approx. 1200 min⁻¹ (+/- 100 min⁻¹) is reached. Due to the intelligent electronics, however, safe (permanent) operation is still guaranteed.

iQ – Intelligence that pays

The iQ savings potential in the long term

If you look at the figures for the iQ-motor over a prolonged period, its considerable energy-savings potential becomes especially obvious.



Electricity price: 0.13 euro per kWh

Number of motors: 200

Continuous operation (24 h/365 d)

Axial blades: 200 mm/28° blade angle

CO₂ emissions factor: 0.596 kg per kWh (Federal Environment Agency, Dessau, May 2008)

— iQ 3612
— AC-shaded-pole motor (comparable)



All advantages at a glance

- High efficiency of up to 65 %
- Constant speed, even in the event of voltage fluctuations
- High running smoothness due to low-friction bearing system
- Intelligent electronics with n-control, overload and locked-rotor protection
- Conventional AC technology can be replaced easily
- Identical accessories and dimensions to Q-motor
- Long service life due to maintenance-free ball bearings
- One solution replaces multiple sizes of comparable AC motors

A quick example calculation:

A typical supermarket operates 200 AC fans with 200 mm blades (blade angle 28°) in its refrigeration units. If the shaded-pole motors were to be replaced by iQ motors, the energy consumption would be reduced by 38 megawatt hours. That is an annual saving of more than 4,950 euros* and a good 22.6 tonnes of CO₂.



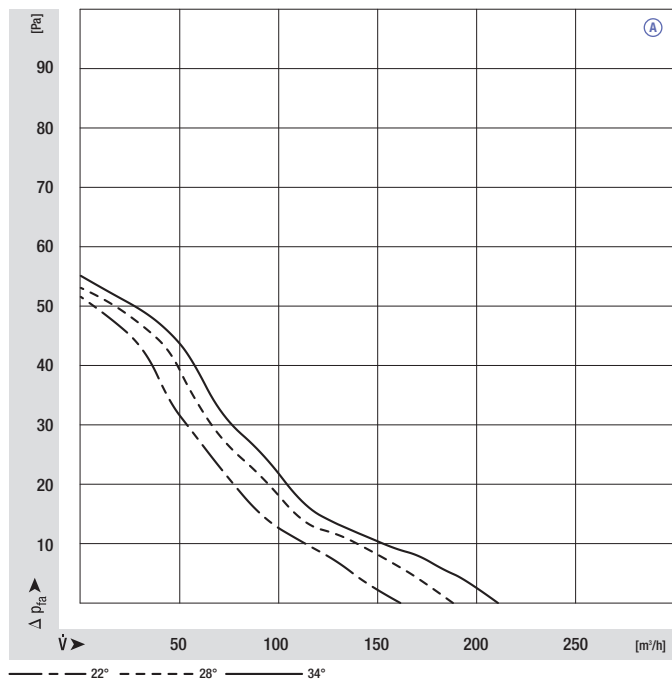
Reduction in power input:: 70 %	Annual reduction in energy consumption: 38 MWh	Annual reduction in energy costs: ≈ 4,950 euros total	Annual reduction in emissions: 22.6 tonnes CO₂
---	--	---	---

*Assumptions: electricity price 0.13 euros per kWh, continuous operation 24 hours a day, 365 days a year

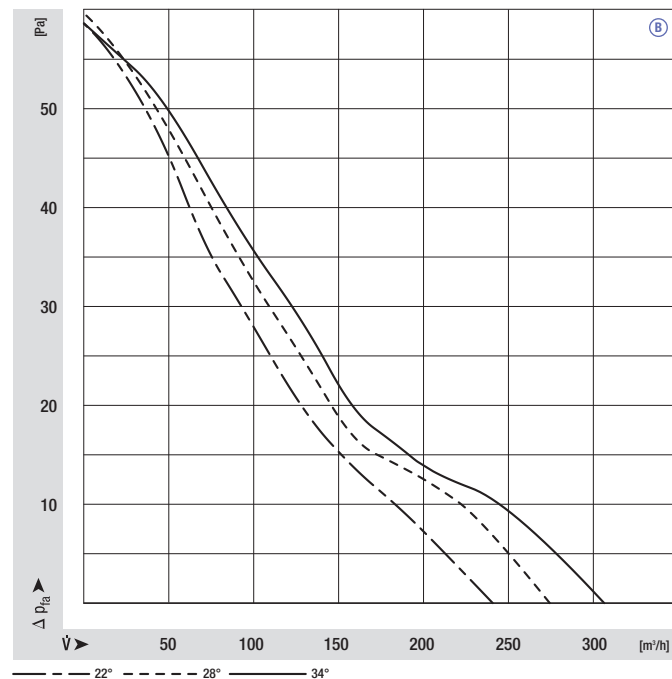
iQ-motor

Air performance curves (measured in wall ring)

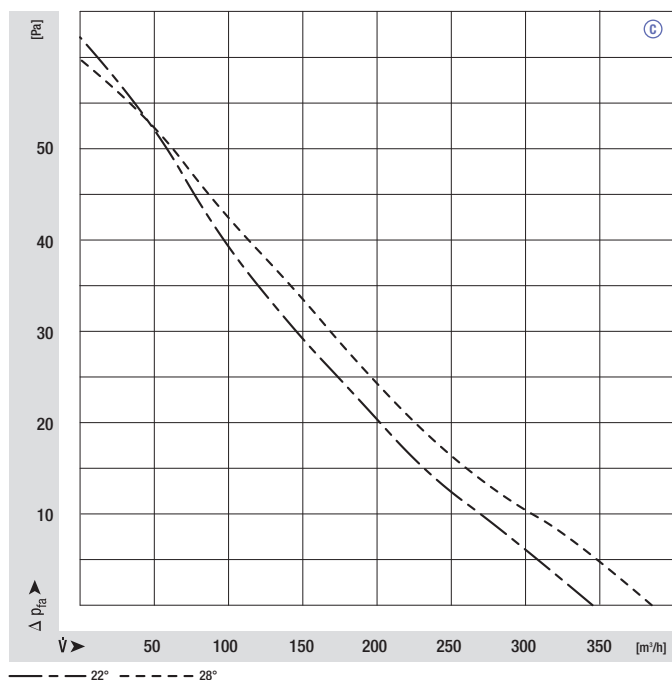
iQ 3608, Ø 154



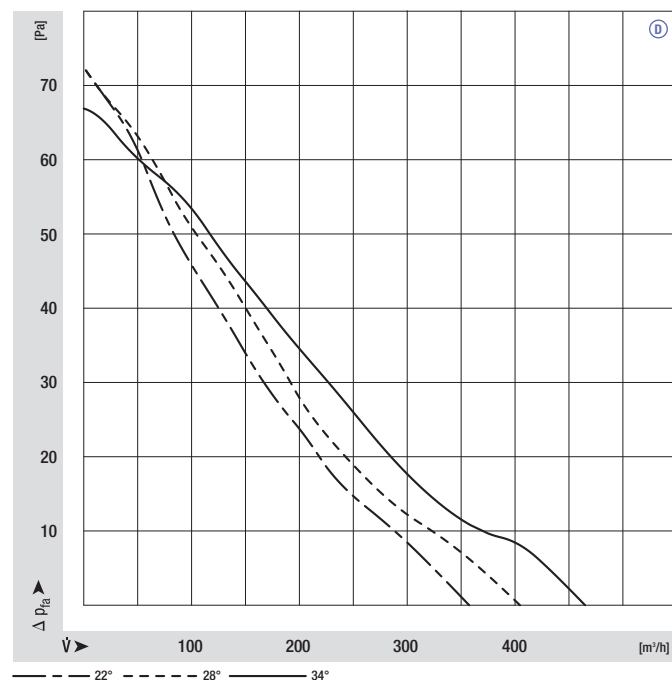
iQ 3608, Ø 172



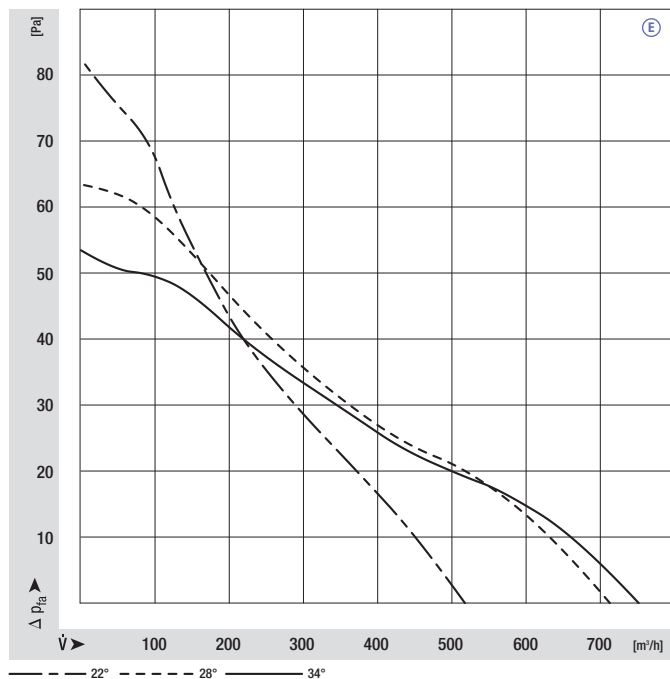
iQ 3608, Ø 200



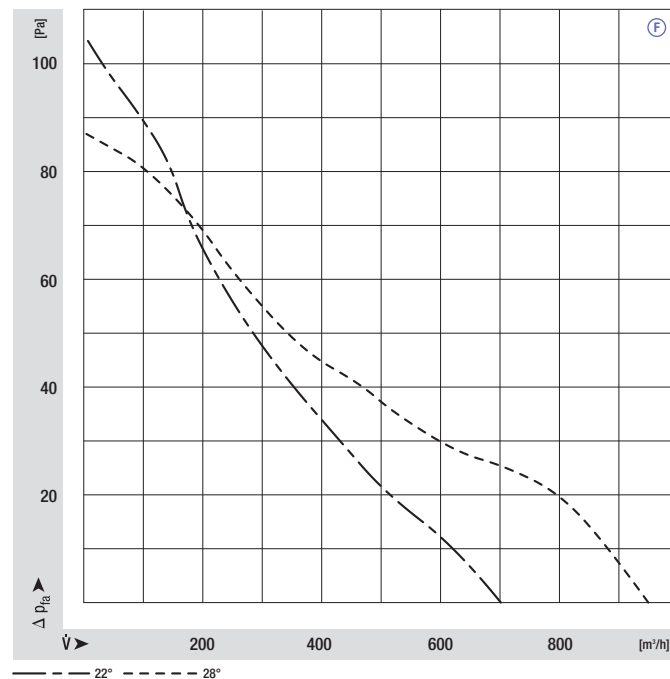
iQ 3612, Ø 200



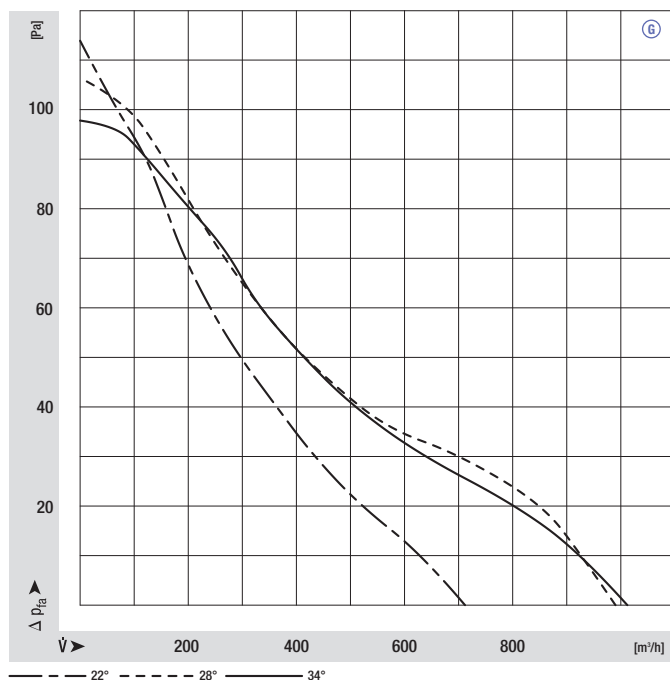
iQ 3612, Ø 230



iQ 3612, Ø 254



iQ 3620, Ø 254



iQ 3620, Ø 300

