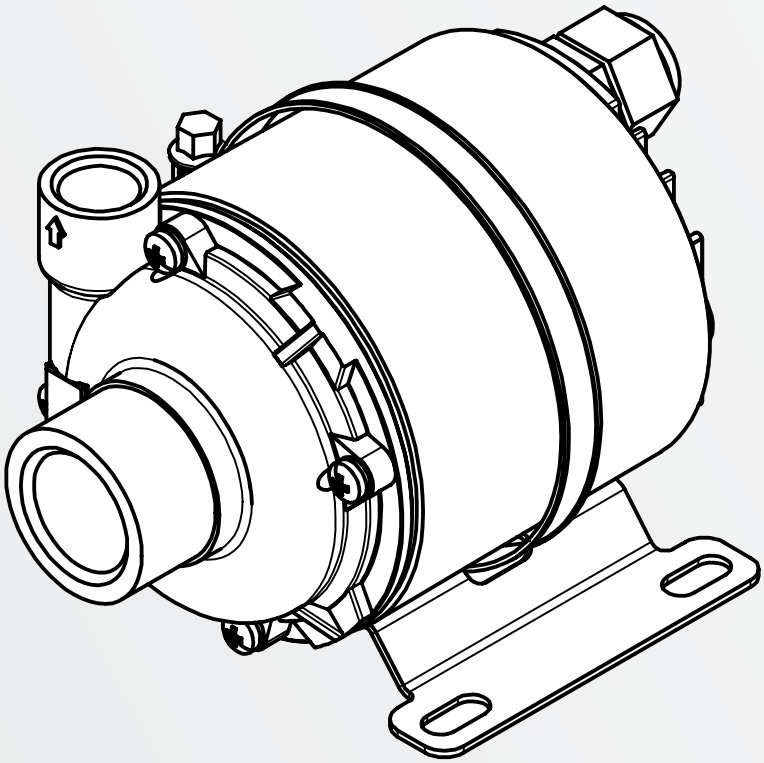
Technical Documentation
Centrifugal Pump with Canned Motor

MY04-46-MM



speck

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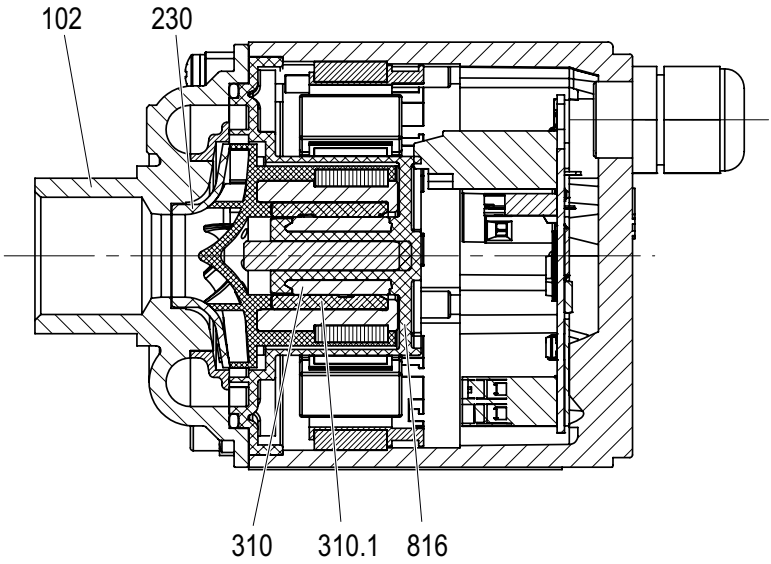


Description

Hermetically sealed centrifugal pump with canned motor.

Impeller (230) and inner magnet form a unit, that is supported by a medium-lubricated sleeve bearing (310). The power transmission from motor to shaft is produced by a rotating field, generated by coils, directly to the inner magnet. The can (816) separates the pumping chamber from the atmosphere. An integrated electronic circuit provides for the rotating field and controls the pump speed.

The drive is free from bearings and rotating components: No maintenance is necessary in standard operation.

Applications

The pump can be used in the following fields of application, e. g.:

Temperature controlling and industrial cooling
» delivery of cold brine
» maintenance of cooling circuits
» air-conditioning of the passenger compartment in trucks, buses, trains and vehicles with fuel cell plants

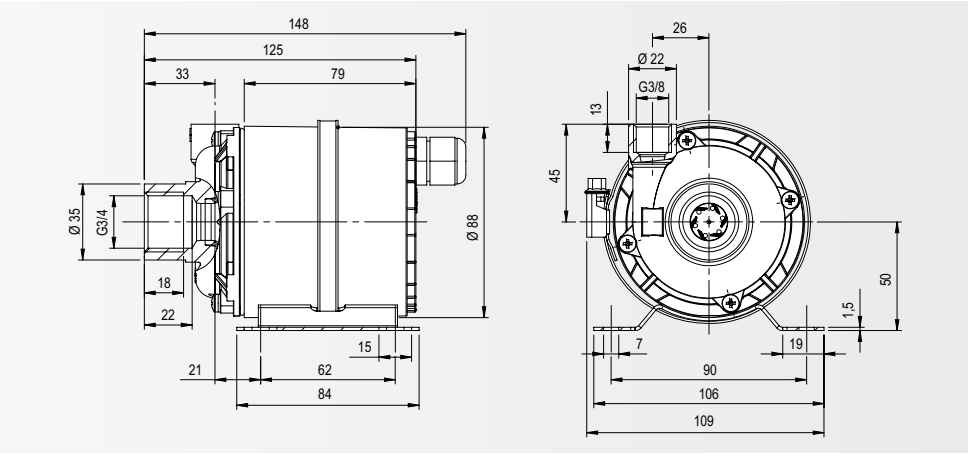
Medical engineering
» Cooling of X-ray emitter in computer tomographs

Technical data

Pumped media	Clear or unclear liquids or mixtures without solids and with good lubricating qualities, not aggressive to the pump components. Other liquids on request.
Temperature / Medium	- 30 °C up to + 80 °C (- 22 °F up to + 176 °F), medium has to be liquid!
Installation	Dry installation in buildings or in roofed places outdoors. Not permitted in Ex-zones.
Ambience	- 30 °C up to + 40 °C (- 22 °F up to + 176 °F) ambient temperature, max. 80% air humidity. Protect the pump against ambient atmosphere or vapours with high concentrations of acids or solvents.
Static system pressure	max. 2.5 bar (max. 36.3 psi)
Motor power	max. 180 W (0.23 HP), depending on load and speed
Nominal voltage	24 V
Operating voltage	18 to 28 V
Current consumption	max. 7.5 A, depending on load and speed
Fuse	10 A
Speed	2000 up to 6500 rpm possible parameters set by Speck
Direction of rotation	Right (view from pump front side), cf. marking on pump casing
Protection class	IP 54, higher degree of protection on request
Sound pressure level	max. 46 db(A) in a distance of 1 m (3.3 ft) to all sides
Connecting wire	1000 mm +/- 20 mm (39.3" +/- 0,8") insulating hose with loose wire-endings 50 mm (1.9"), isolated without ferrules, 5 mm (0.2") stripped. See detailed information in table „wire specification"
Cable connection	M 16 x 1.5 plastics black
Pumping capacity	Hmax. 15,5 m, Qmax. 55 l/min
Lifetime	20,000 hours of operation according to standard mode of operation
Protection against dry running	Not existing, the pump has to be protected against dry running by the user
Blocking protection	In the state of a blocked impeller the starting attempts will be continued indefinitely
Overload protection	Integrated electronics automatically reduce motor speed when reaching max. admissible motor temperature
Max. surface temperature	approx. + 90 °C (+194 °F)
Storage temperature	- 40 °C up to + 120 °C (-40 °F up to +248 °F)
Lacqueur	Motor and pump housing unpainted
Weight	1,7 kg (3.75 lbs)

Description

Dimensional drawing

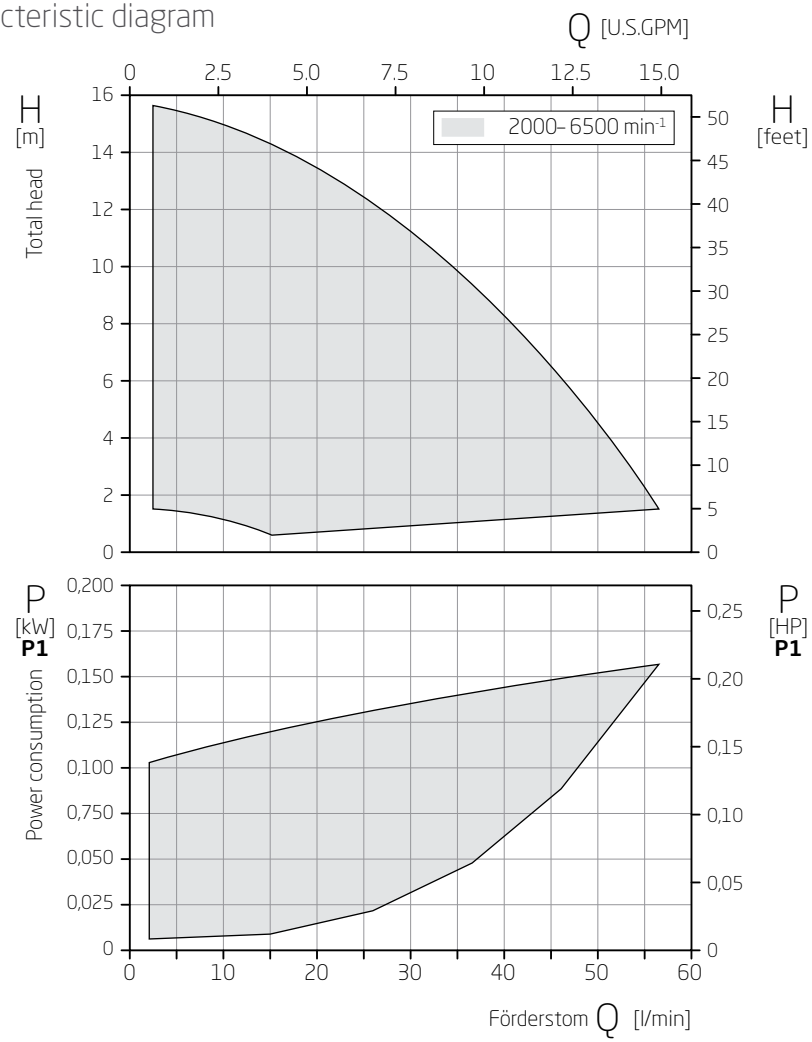


Materials

Casing part	1.4571 / Stainless steel
Impeller	PPS (polyphenylensulfide with 40% fibre glass)
Sleeve bearing	SiC
Separating can	PPS (polyphenylensulfide with 40% fibre glass)
O-rings	FKM, EPDM or NBR

Foot optional

Characteristic diagram



Within the displayed performance curves, any operating point can be realized by a corresponding parameterization of the drive.
The performance curves apply to the delivery of water with a temperature of 20 °C (68 °F) and an ambient temperature of 20 °C (68 °F).

Total head and flow rate have a tolerance range of ±10%, whereas the power requirement may deviate by +10%. Deviating properties of the medium to be pumped and different ambient temperatures affect the performance curves.
Power requirement P1 refers to the electrical power consumption.

Fixing and installation

Pump connections

The preferred position for the installation of the pump is a horizontal position. The ideal position of the discharge hose connector is an upwards-position in a 50° angle as shown in the dimensional drawing. This position guarantees an optimized bleeding of the pump.

By loosening the tension clamp of the foot[1], the position of the hose connector can be relocated. Clamping torque is 3 - 5 Nm.

Installing instructions

An open and well-ventilated place has to be chosen for the installation of the pump. Foot[1] fastening with four M 6 screws in an appropriate, accessible place. The connections of suction and delivery pipe to the pump casing and the pump connections in general should be assembled tension-free.

The size of pipings in the complete hydraulic circuit should not be less than the nominal width ot the hose connectors. Do not use any kind of isolating material around the pump. Check all pipes according to fixed position and tightness.

Electrical connections

The connecting wire has to be installed tension-free.

Electrical Installation

Connect the red strand 2.5 mm² with the 24 V positive pole of the power supply unit.

Connect the black / blue strand 2.5 mm² with the 24 V negative pole of the power supply unit.

Pay attention to use well-dimensioned cable connections.

Optional features

Option: Adjustable speed

Motor speed is defined by the control lines proportional to applied voltage (0 – 10 V) or current (0 – 20 mA). Speed depends on the particular programming of the motor. If the control lines are not connected, the motor runs with a programmed speed for 0 V, respectively for 0 mA. Connect the yellow strand 0.34 mm² with the 0 – 10 V-positive pole of the control voltage source or the grey strand with the 0 - 20 mA-positive pole of the control power source. Connect the black strand 0.34 mm² with the negative pole of the control voltage or power source.

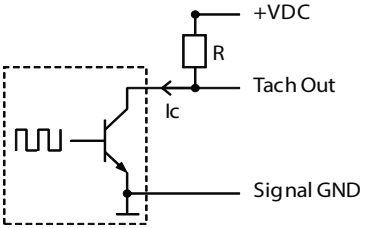
Option: Turn on/off

The motor can be turned on and off by the control line „Active Low" without cutting off power supply. Connect the green strand (Active Low) with Signal GND (black strand 0.34 mm²) to turn off the motor.

Option: Speed signal

A speed proportional open collector square signal is issued by the brown control line (Tach Out), referring to signal GND.

Speed [Hz] = frequency of rectangular signal [Hz].



Resistance R has to be selected according to applied voltage VDC, that the current Ic may not exceed 20 mA. At VDC = 10 V, R usually is approx. 1 kΩ.

Notice

Supply ground (Power GND) and signal ground (Signal GND) are connected internally!

1 optional

Inverse-polarity protection
Supply lines (+ 24 VDC and Power GND) are not protected against inverse polarity, but resitant to inverse politarity for a short term. In this case the inverse polarized supply voltage is short-circuited (max. 100 A for 100 ms). For this reason, a fuse (10 A) is obligatory when connecting the batteries/vehicle electric systems. When connecting to electronic power supplies (power of less than 500 W), a fuse is not required. The control lines are protected up to ± 25 V (correct and inverse polarity).

The hydraulic system has to be completely filled and bled before the first start up. The pump has to be filled with the pumped medium. For bleeding the system please pay attention to the instructions by the manufacturer.
Shut-off valves on suction side and on pressure side have to be opened completely.
The delivery of the pump medium has to be initiated immediately after commissiong the pump (no more than 5 seconds). If priming does not occur, the pump has to be turned off to avoid damages of dry running.

Initial operation
Wire specification

	Function	Cross sections	Colour	Remark
Supply lines	+ 24 VDC	AWG 14 ≙ 2.5 mm²	red	
	Power GND	AWG 14 ≙ 2.5 mm²	black or blue	
Control lines	Signal GND	AWG 22 ≙ 0.34 mm²	black	option available
	Active Low	AWG 22 ≙ 0.34 mm²	green	option available
	Tach Out	AWG 22 ≙ 0.34 mm²	brown	option available
	Control Voltage	AWG 22 ≙ 0.34 mm²	yellow	option available
	Control Current	AWG 22 ≙ 0.34 mm²	grey	option available
	Interface	AWG 22 ≙ 0.34 mm²	white	only applicable by Speck
	Interface	AWG 22 ≙ 0.34 mm²	blue	only applicable by Speck

Trouble shooting

Defect	Cause	Rectification
Pump does not deliver	Supply or suction pipe and pump are not bled correctly or not filled completely	Fill or bleed pump and/or pipes completely
	Motor does not run	Connect motor to the power supply correctly
	Hydraulic parts of the pump are blocked or stuffed by solids	Disassemble pump, remove solids
	Hydraulic parts of a pump are dirty, sticky, incrusted or worn out	Disassemble pump, clean pump parts
Pump delivers with interruptions	Supply suction pipe and pump are not bled correctly or not filled completely	Fill or bleed pump and/or lines completely.
Delivery performance too low	Electronical parts too hot: Motor reduces speed	Keep motor ventilated

UL approvals of material used

Component	Material, manufacturer, note	UL
Motor electronic	Circuit board, plug and plastic material contacting the leads	UL 94 V-0
Casting compound	WEVO casting compound PD 4431 FL The electronic components are covered, only electrolyte capacitors and terminal pins stick out.	UL 94 V-0 (UL / CSA-File E108835)
Motor casing	Aluminium die cast	Irrelevant
Separating can	ALBIS PLASTIC GmbH, Tedur® L 9107-1 (PPS-GF40)	UL 94 V-0 (UL / CSA-File E80168)
Impeller	ALBIS PLASTIC GmbH, Tedur® L 9107-1 (PPS-GF40)	UL 94 V-0 (UL / CSA-File E80168)
Pump casing	1.4581 / Stainless steel	Irrelevant
Strands	The connecting wire is executed as single strands bundled in an insulating hose	UL 3266 / CSA AWM I A/B
Insulating hose	Isotex (combination of glassfibre and silicone)	UL 1441 / UL 94 V-0
Wire connection	Jacob GmbH, polyamide PA6	UL 514 B (UL / CSA-File E140310)

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