



Technical Documentation

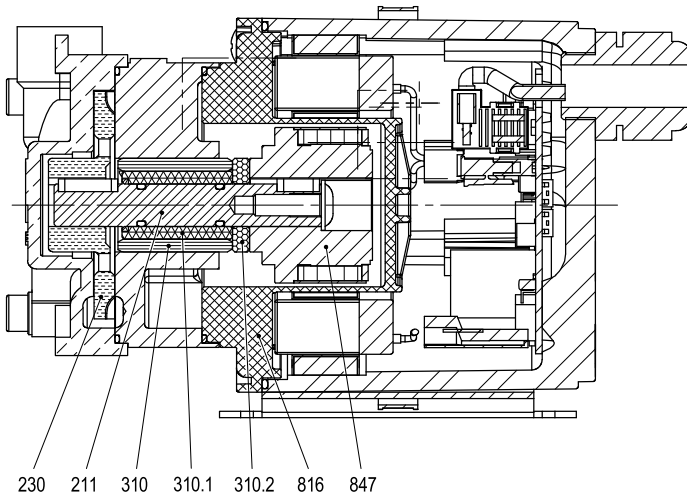
Regenerative Turbine Pump with Canned Motor

Y-2951-W-MM

Technical Documentation

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Y-2951-W-MM



Description

Hermetically sealed centrifugal pump with canned motor.

Impeller (230) and inner magnet (847) are assembled to the same shaft (211), the shaft 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

- cooling of machines, systems and production processes
- cooling of industrial and medical lasers
- climatisation of control cabinets
- tempering devices in laboratory applications

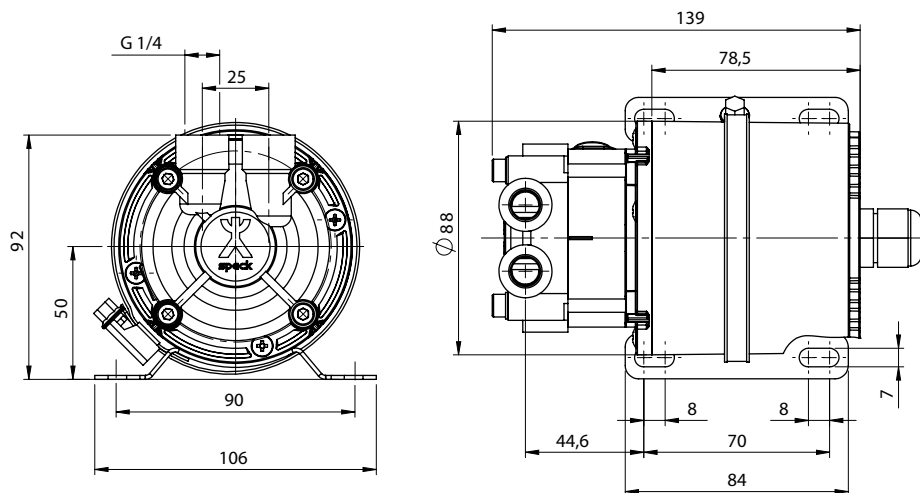
Further applications

- drinking water supply in railcars and on ships
- etc.

Technical Data

Pumped media	Clear or unclear liquids or mixtures without solids and with good lubricating qualities, not aggressive to the pump components, density and viscosity similar to water. 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 to 5000 rpm, possible parameters set by Speck Pumpen
Direction of rotation	Left (view from pump front side), cf. marking on pump connections
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	$H_{max.}$ 45 m (147 ft) $Q_{max.}$ 12 l/min (3.2 USGPM)
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 casing powder-coated RAL 9005 black mat, pump housing unpainted
Weight	1950 g (4.30 lbs)

Dimensions

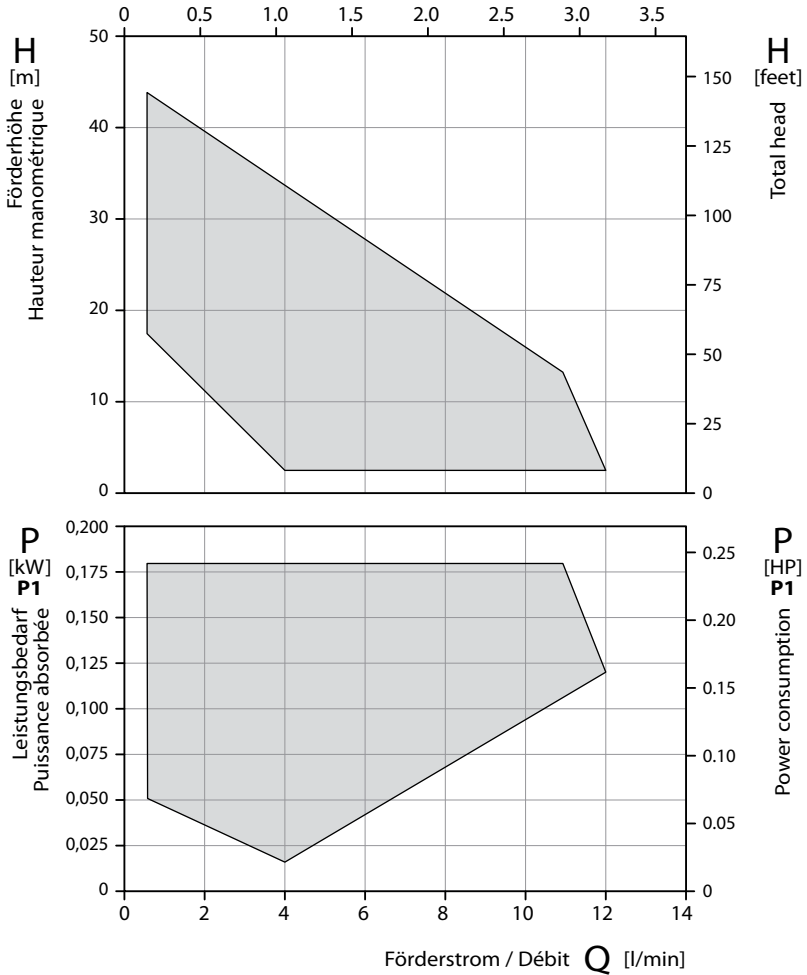



Material

Casing parts	1.4581 or brass
Impeller	PEEK (polyetheretherketone with 30% fibre glass)
Shaft	1.4122
Sleeve bearing	SiC
Separating can	PPS (polyphenylensulfide with 40% fibre glass)
O-rings	FKM

Hydraulic specifications and power consumption

Capacity Q [U.S.GPM]



 2000 – 5000 1/min - rpm - tr/min

Every operating point can be reached within these characteristic fields by setting different drive parameters.

The characteristic fields are applicable for the delivery of water of 20 °C (68 °F) temperature and an ambient temperature of 20 °C (68 °F).

The tolerance of total head and capacity is $\pm 10\%$, performance tolerance is $+10\%$. If the property of the pumped media differs, the characteristic fields change.

The power consumption P1 specifies the electrical power input.

Fixing and installation

Pump connections

The preferred position for the installation of the pump is a horizontal position. By loosening the tension clamp, the position of the pump connections (state of delivery: on top) can be removed deliberately.

For Y-2951-W-MM in the ranges of 90° to the left (9 o'clock position) or 90° to the right (3 o'clock position).

Clamping torque is 3 - 5 Nm. Avoid an incident flow from below.

Installing instructions

An open and well-ventilated place has to be chosen for the installation of the pump. Foot fastening with four M6 screws in an appropriate, accessible place. The connections of suction and discharge pipe to the pump casing and the pump connections in general should be assembled tension free.

Size of pipes should not range below ¼". Do not use any kind of insulating material around the pump. Check all pipes according to fixed position and tightness.

Electrical connections

The connecting wire has to be installed tension free.

Wire specification

Supply lines

Function	Cross sections	Colour
+24 VDC	AWG 14 $\hat{=}$ 2.5 mm ²	red
Power GND	AWG 14 $\hat{=}$ 2.5 mm ²	black or blue

Control lines

Function	Cross sections	Colour	
Signal GND	AWG 22 $\hat{=}$ 0.75 mm ²	black	option available
Active Low	AWG 22 $\hat{=}$ 0.75 mm ²	green	option available
Tach Out	AWG 22 $\hat{=}$ 0.75 mm ²	brown	option available
Control Voltage	AWG 22 $\hat{=}$ 0.75 mm ²	yellow	option available
Control Current	AWG 22 $\hat{=}$ 0.75 mm ²	grey	option available
Interface	AWG 22 $\hat{=}$ 0.75 mm ²	white	only applicable by Speck Pumpen
Interface	AWG 22 $\hat{=}$ 0.75 mm ²	blue	only applicable by Speck Pumpen

Single wires bound in an insulating hose

Electrical Installation

Connect the red strand 2.5 mm² with the 24 V- positive pole of the power supply unit. Connect the black strand 2.5 mm² with the 24 V-negative pole of the power supply unit. Pay attention to use well-dimensioned cable connections.

In addition, optional features are available:

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 0.75 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 0.75 mm² with the negative pole of the control voltage or power source.

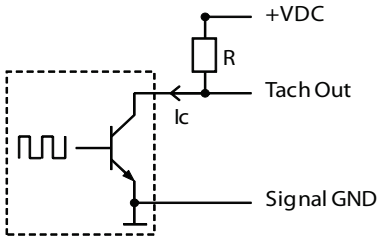
Option Turn on/off:

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 0.75 mm²) to turn off the motor.

Optional 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 I_c 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!

Inverse-polarity protection

Supply lines (+24 VDC and Power GND) are not protected against inverse polarity, but resistant to inverse polarity for a short term. In this case the inverse polarized supply voltage is short-circuited (max. 100 A for 100 ms).

Control lines are protected up to ±25 V (right and inverse polarized).

Initial operation

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 commissioning 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.

Trouble shooting

Disturbance	Cause	Action
Pump does not deliver	Supply 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, incrustated 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, comment	UL
Motor electronics	PCB and plug as well as plastic parts being in contact with conductors	UL94 V-0
Casting compound	WEVO casting compound PD 4431 FL The electronic components are covered, only electrolyte capacitors and connector pins protrude from the compound.	UL94 V-0 (UL / CSA-File E108835)
Motor casing	Die-cast aluminium Polyester resin based Interpon® 610 powder coating	Not applicable UL 1332
Separating can	ALBIS PLASTIC GmbH, Tedur® L 9107-1 (PPS-GF40)	UL94 V-0 (UL / CSA-File E80168)
Impeller	VICTREX® PEEK™ 450FC30	UL94 V-0 (UL / CSA-File E161131)
	Luvocom® 1105-0699 (PEEK fiber-reinforced, lubricant modified)	UL94 V-0 (UL / CSA-File E108976)
Pump casing	1.4581	Irrelevant
Strands	The connecting cable has single strands which are bundled in an insulating hose.	UL3266 / CSA AWM I A/B
Insulating hose	Isotex (combination of glassfibre and silicon)	UL-1441 / UL94 V-0
Cable gland	Jacob GmbH, polyamide PA6	UL 514B (UL / CSA-File E140310)