

Pioneering for You

wilo

HVAC OEM Competence Centre

Yonos PARA ST **/7.0 iPWM2 Datasheet

iPWM



ErP
READY

APPLIES TO
EUROPEAN
DIRECTIVE
FOR ENERGY
RELATED
PRODUCTS

Yonos PARA ST **/7.0 iPWM2



Field of application



Solar thermal

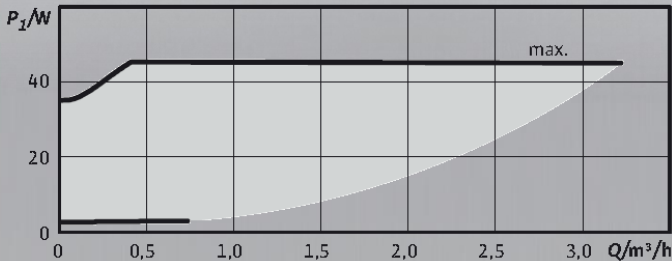
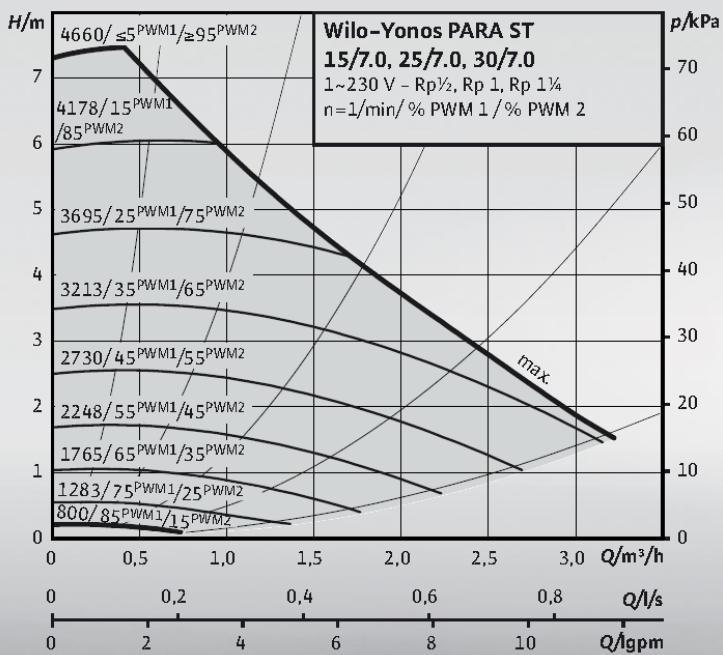
Yonos PARA ST 15/7.0 iPWM2 130 12

Yonos PARA	High Efficiency pump for heating application
ST	Inline cast iron pump housing dedicated for solar thermal application
15	Threaded connection DN 15 (25, 30 : also available)
7.0	7.2 = delivery head in [m] at Q = 0 m ³ /h
iPWM2	The pump is controlled by an external system via iPWM signal, i=feedback
130	Pump housing length 130 mm (180 mm: also available)
12	Control box orientation 12 o'clock (3, 6, 9 o'clock: also available)

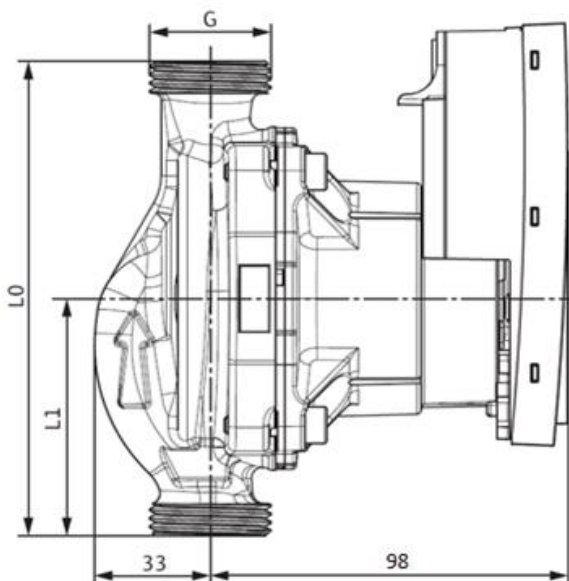
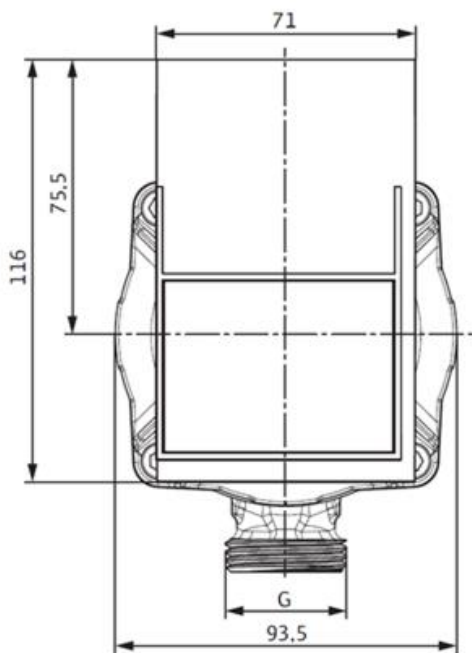
Hydraulic operational area



External control via iPWM



Dimensions



Thread	Overall length (mm)	Dimensions (mm)
	10	L1
G1"	130	65
G1 1/2"	130	65
G1 1/2"	180	90
G2"	180	90



Electrical connections

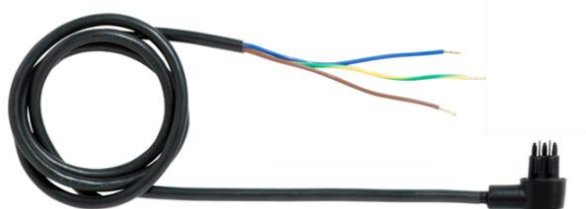
Integrated Molex 3-way connector



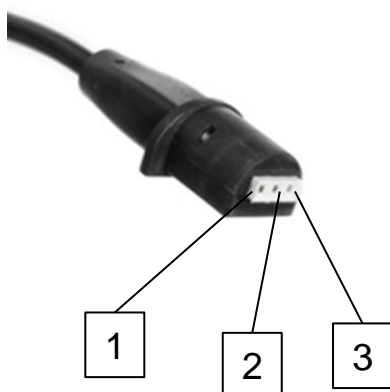
Overmoulded connector



Overmoulded power cables



Standard signal cables



Signal	Overmoulded Pin	Cable color
PWM input (from controller)	1	brown
PWM common	2	Grey or blue
PWM output (from the pump)	3	black

Approved fluids (other fluids on request)	Heating water (in accordance with VDI 2035) Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)
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Power

Energy Efficiency Index (EEI-part 3)	≤ 0,20
Max. delivery head	7.3 m
Max. volume flow	3.3 m³/h

Permitted field of application

Temperature range for applications in HVAC systems at max. ambient temperature. Limit values for continuous operation at maximum rated power	Of 55°C = 0 to 110°C Of 62°C = 0 to 90°C Of 66°C = 0 to 80°C Of 71°C = 0 to 70°C
Maximum static pressure	PN 10

Electrical connection

Mains connection	1~230 V +10%/-15%, 50/60 Hz (IEC 60038 standard voltage)
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Motor/electronics

Low voltage directive	2006/95/EC Conform
Electromagnetic compatibility	EN 61800-3
Emitted interference	EN 61000-6-3 EN 61000-6-4
Interference resistance	EN 61000-6-2 EN 61000-6-1
Protection class	IPx4D
Insulation class	F
RoHS / REACH	Compliant but not submitted

Minimum suction head at suction port to avoid cavitation at water pumping temperature

Minimum suction head at 50/95°C	0.5 / 4.5 / 11 m
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Motor data

Yonos PARA	Speed	Power consumption 1-230 V	Current at 1-230 V	Motor protection
	n	P1	I	-
	rpm	W	A	-
ST **/7.0 iPWM2	800 / 4660	3-45	0.03-0.44	Integrated

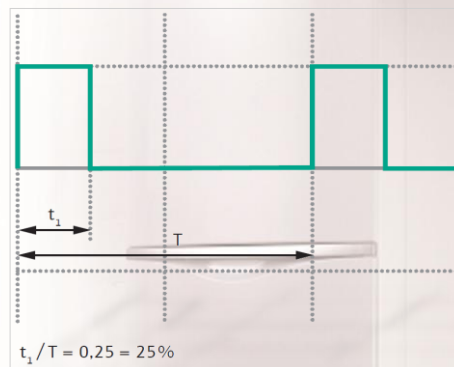
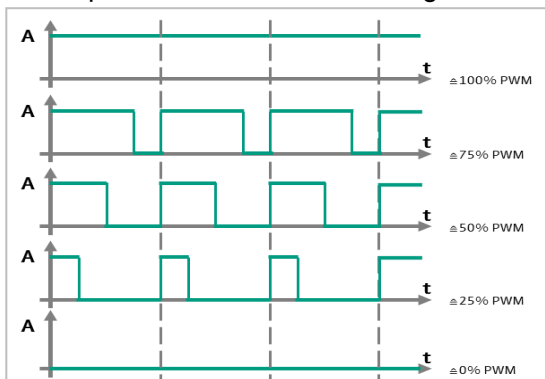
Materials

Yonos PARA	Pump housing	Impeller	Pump shaft	Bearing
ST **/7.0 iPWM2	PA6.6 composite with GF 30%	PP composite with GF 40%	Stainless steel	Carbon, metal impregnated

External control via an iPWM system



The actual/setpoint level assessment required for control is referred to a remote controller. The remote controller sends a PWM signal as an actuating variable to the Wilo-Yonos PARA. The PWM signal generator gives a periodic pulse order to the pump (the duty cycle) according to DIN IEC 60469-1. The actuating variable is determined by the ratio between pulse duration and pulse period. The duty cycle is defined as a ratio without dimension, with a value of 0 ... 1 or 0 ... 100 %. This is explained in the following with ideal pulses which form a rectangular wave.



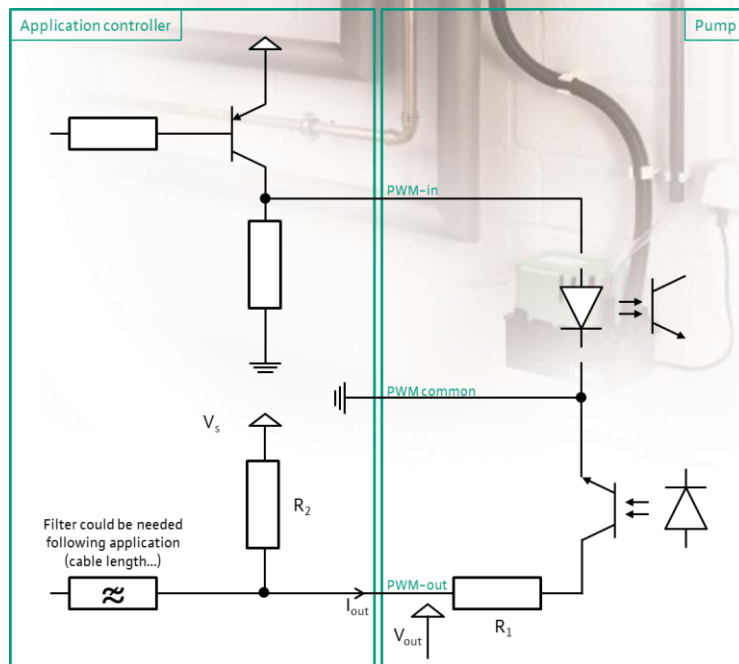
iPWM interface

PWM-in

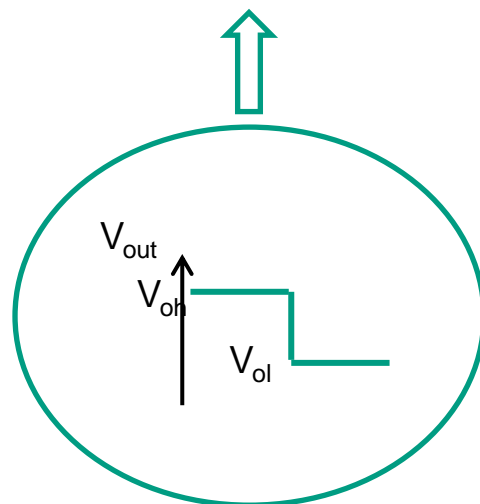
Signal frequency:	100 Hz-5000 Hz (1000 Hz nominal)
Signal amplitude:	Minimum 3.6V at 3 mA Up to 24V for 7.5 mA absorbed by the pump interface

PWM-out

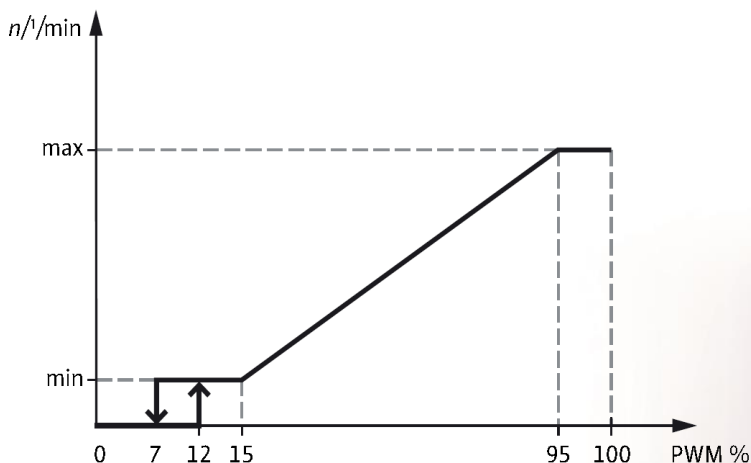
V_s	$3V \leq V_s \leq 24V$
R_2	$(V_s - 0,2) / I_{out} - R_1$
R_2C	$\leq \frac{1}{1000 * \ln(0.3) * 75}$
C=filter capacitor	for rise time impact < 0.1%



Signal frequency:	75Hz +/- 2Hz
R_1	470Ω +/-5%
$V_{ol} = V_{out\ low}$	<1V for $I_{out} < 1mA$

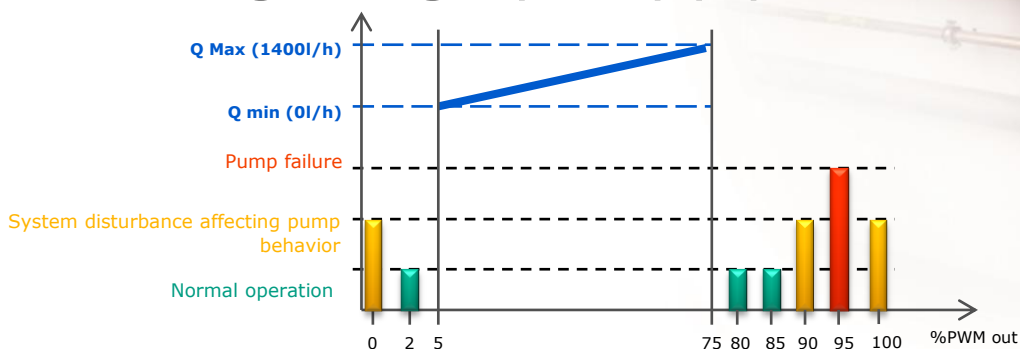


iPWM-in signal logic 2 (solar) (%)



< 7	Pump stops (standby)
7-15	Pump runs at minimum speed (operation)
12-15	Pump runs at minimum speed (start-up)
15-95	Pump speed increases linearly from minimum to maximum
> 95	Pump runs at maximum speed

iPWM-out signal logic (solar) (%)



% PWM-out	Status	Potential causes
0	Pump output iPWM interface damaged	iPWM interface in short circuit
2	Stand-by, pump is ready to run	/
5-75	Pump is running normally, flow information is supplied	/
80	Abnormal running mode Pump is running but not at optimal performance	- Undervoltage 160/170-194V - Self thermal protecting mode
85	Abnormal function mode Pump has stopped but is still functional	- Undervoltage <160/170V - Overvoltage - Unexpected external flow
90	Abnormal function mode Pump has stopped but is still functional Check the installation setup and medium	- Failure on another component than pump - Debris in the installation - Bad temperature setup
95	The pump has stopped due to permanent failure	- Pump blocked - Electronic module out of order
100	Problem of iPWM connection	iPWM interface in open circuit

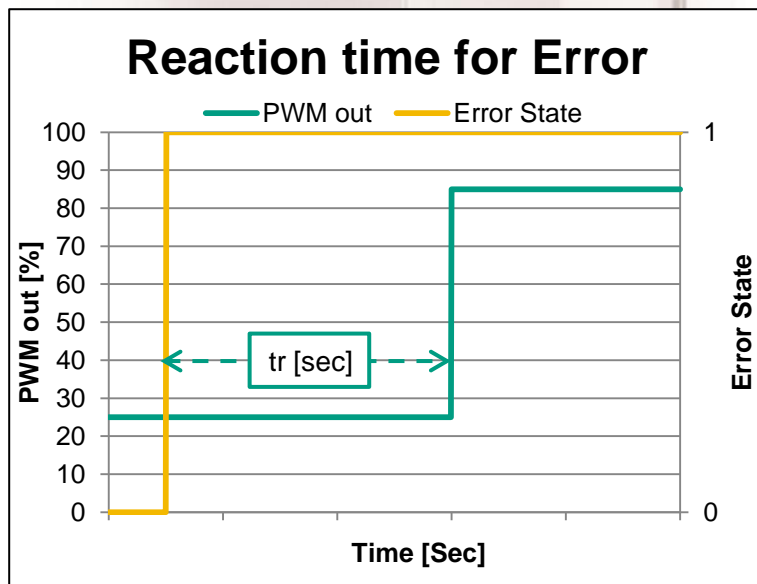
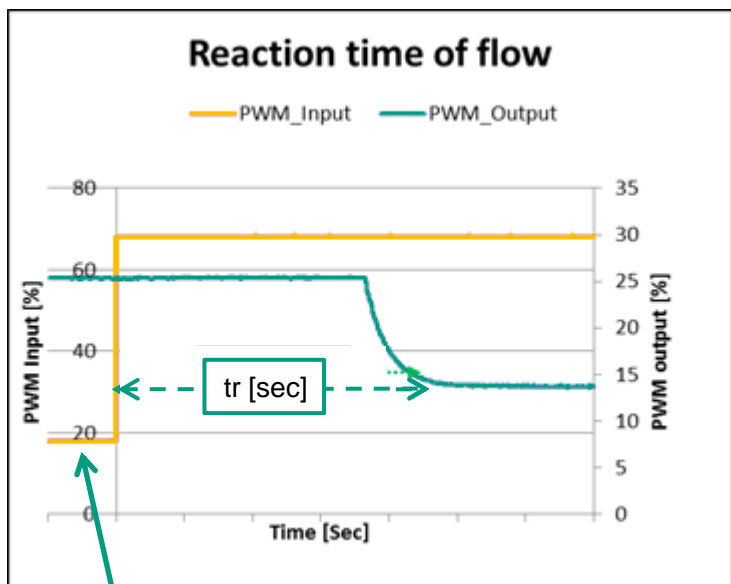


iPWM-out accuracy

Solar circuit (water)	Accuracy on measurement with temperature correction matrix (valid for rotation speed > 2000 RPM)	Resolution on iPWM output (additional to accuracy)
for Q ≤ 600L/h	+/- 60 L/h*	10 L/h
for Q > 600L/h	+/- 10%*	10 L/h

*temperature correction factor available on demand for refining

iPWM-out reaction time



Demand of modification via iPWM-in at t=0

Failure	Reaction time 'tr' [sec]
Undervoltage	<2
Blocked rotor	<5
Flow adjustment (90% of targeted flow)	<5

If the controller adjusts iPWM-in with a higher frequency than the “reaction time”, the flow adjustment sent by iPWM-out may not be updated. However the rotation speed will change according to the demand.

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