

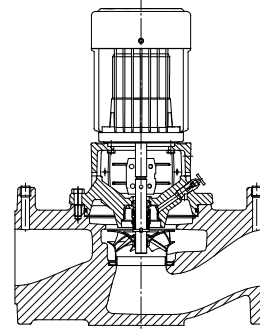


Fig. 4 TP Series pumps

TM03 4875 3206

Materials

TP, TPE



TM 00 9274 2002

Fig. 5 Sectional drawing of a single-phase TP pump

Technical data

Flow rate: up to 300 gpm

Head: up to 65 ft

Liquid temperature: -13 to +284°F

Max. operating pressure: up to 145 psi

Note: See Grundfos product guide L-TP-PG-001 for performance range.

Construction

Grundfos TP pumps are single-stage, close-coupled pumps with in-line suction and discharge ports flanges of identical diameter.

The pumps are equipped with a fan-cooled asynchronous motor. Motor and pump shafts are connected via a rigid two-part coupling.

The pumps are equipped with an unbalanced mechanical shaft seal.

The pumps are of the top-pull-out design, i.e. the power head (motor, pump head and impeller) can be removed for maintenance or service while the pump housing remains in the pipework.

As radial and axial forces are absorbed by the fixed bearing in the motor drive-end, the pump requires no bearing.

Pumps with bronze pump housing are suitable for circulation of domestic hot water.

Material specification

Pos.	Component	Material	AISI, ASTM
1	Pump housing	Cast iron ,	EN-JL 1040 ASTM 48 CL 30
2	Impeller	Stainless steel	304
3	Shaft	Stainless steel	431
4	Coupling	Cast iron	
5	Pump head	Cast iron ,	EN-JL 1040 ASTM 48 CL 30
	Secondary seals	EPDM	ASTM 48 CL30
	Rotating seal face	Tungsten carbide	
	Stationary seat	Carbon (synthetic resin-impregnated) tungsten carbide	

Mechanical shaft seal

Three types of unbalanced mechanical shaft seal are available as standard:

- **BUBE**
The BUBE shaft seal is a Grundfos rubber bellows seal with tungsten carbide/carbon seal faces and secondary seals of EPDM. (Standard seal)
- **RUUE**
The RUUE shaft seal is a Grundfos O-ring seal with reduced tungsten carbide/tungsten carbide seal faces and secondary seals of EPDM.
- **AUUE**
The AUUE shaft seal is a Grundfos O-ring seal with fixed seal driver, tungsten carbide/tungsten carbide seal faces and secondary seals of EPDM.

Information on a selection of common pumped liquids with recommended shaft seals is shown on page 16.

Shaft seal specification

Unbalanced shaft seal	TPE	version NU according to EN 12756
Shaft diameter		12 and 16 mm
Rubber bellows		EPDM
Seal faces		Tungsten carbide/carbon
		Tungsten carbide/ tungsten carbide
		Silicon carbide/ silicon carbide

Special shaft seals are available for partly conditioned water or other liquids containing abrasive or crystallising particles. See page 16.

Connections

Pumps up to 2" discharge has US standard flanges. 3" and higher discharge flanges are 125# ANSI connection.

Control

Electronically controlled TPE, pumps are suitable for demand-dependent performance control.

TPE pumps have the following features and benefits:

Optimised hydraulics for high efficiency

- reduced power consumption.

TPE pumps with built-in frequency converter

- 2-pole and 4-pole TP pumps from 0.33 to 1.5 HP single phase are available as TPE pumps with built-in frequency converter. For further information, see page 26.

Top-pull-out design

- easy dismantling in case of service.

In-line design

- contrary to end-suction pumps, in-line pumps allow a straight pipework and thus often reduced installation costs.

Pump housing and pump head are electrocoated

- high corrosion resistance.

Electrocoating includes:

1. Alkaline cleaning
2. Pre-treatment with zinc phosphate coating
3. Cathodic electrocoating (epoxy)
4. Curing of paint film at 200-250°C.

For low-temperature applications at a high humidity, Grundfos offers TP pumps with extra surface treatment to avoid corrosion. These pumps are available on request.

Stainless steel impeller and neck ring

- wear-free operation with high efficiency.



Fig. 6 TPE

TM03 0348 4904

Technical data

Flow rate:	up to 200 gpm
Head:	up to 60 ft
Liquid temperature:	-13 to +284°C
Max. operating pressure:	145 psi
Motor sizes (single-phase):	0.33 to 1.5 hp

Construction

TPE, Series 2000 pumps are based on TP pumps.

The main differences between the TP and the TPE Series 2000 pump range are the motor and the factory-fitted integrated differential pressure sensor.

The motor of TPE Series 2000 pumps has built-in frequency converter designed to continuously regulate the pressure based on the flow demand.

The TPE Series 2000 range is recognized as a pre-set solution for quick and safe installation.

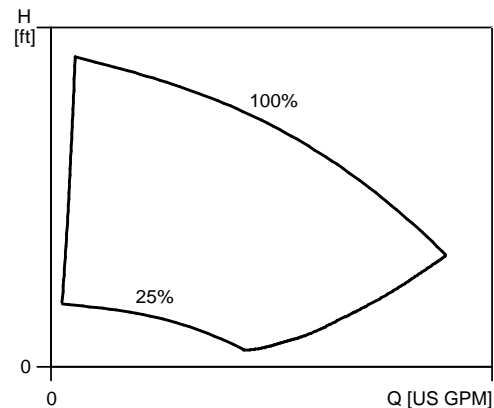
For further information on construction and materials of TPE Series 2000 pumps, see page 17.

Applications

TPE Series 2000 pumps have integrated speed control for automatic adaptation of performance to current conditions.

This ensures that the energy consumption is kept at a minimum.

TPE Series 2000 pumps can operate in any duty point within the range between 25% and 100% speed.



TM03 3609 0506

In the QH-chart the 100%-curve corresponds to the curve for a pump fitted with a standard fixed-speed motor.

Depending on the nature of the application, TPE Series 2000 pumps offer energy-savings, increased comfort or improved processing.

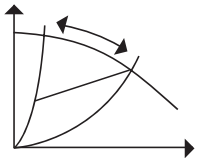
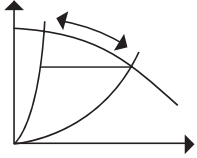
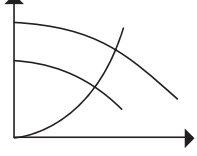
TPE Series 2000 pumps are suitable for applications where you want to control the pressure.

Differential proportional pressure

TPE Series 2000 pumps are factory-set to proportional pressure. We recommend proportional pressure control in systems with relatively large pressure losses as it is the most economical control mode.

TPE Series 2000 pumps set to proportional pressure control continuously adjust the pump head to the system water requirement.

The charts below show possible control modes of TPE Series 2000 pumps in different applications.

Control mode	Application
Differential proportional pressure	
	Systems with two-way valves - the head against closed valve is half the setpoint.
Differential Constant pressure	
	Systems with two-way valves.
Constant curve	
	Single-pipe heating system. Systems with three-way valves. Heating and cooling surfaces. Chiller pumps

Control options

Communication with TPE Series 2000 pumps is possible via:

- a central building management system
- remote control (Grundfos R100) or
- a control panel.

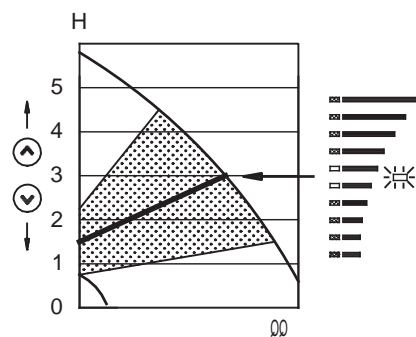
The purpose of controlling TPE Series 2000 pumps is to monitor and control the pressure.

For further information on control options of TPE pumps, see page 25.

Pump selection guidelines

Differential proportional pressure control

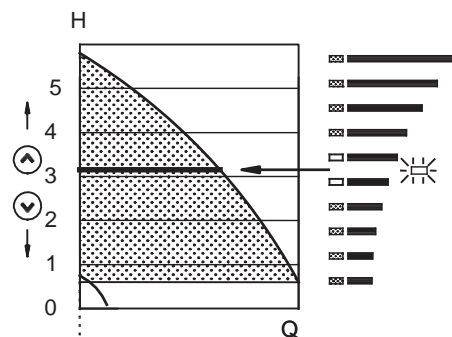
TPE 2000 pump operating range in differential pressure control mode is between 3/4th of the maximum head (shut off) to 1/4th of the maximum head. Pump shall be selected to operate within this range when pump is running full load speed. With differential proportional control, pump will follow a straight line between set point and half of the set point at closed valve as shown below.



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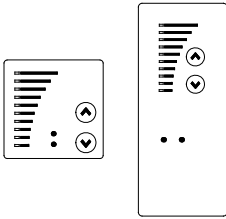
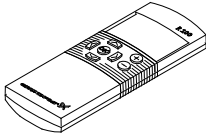
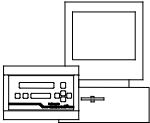
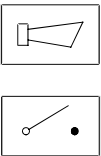
Constant differential pressure control

The setting range for constant pressure control is between maximum head to 1/8th of the maximum head.



TM03 3671 0606

Overview of Functions

	E-pump functions	TPE Series 2000 with single-phase MLE
	Setting via control panel:	
	Setpoint	●
	Start/stop	●
	Max. curve	●
	Min. curve	●
	Alarm reset	●
	Constant/proportional pressure	●
	Reading via control panel:	
	Setpoint	●
	Operating indication	●
	Fault indication	●
		Setting via R100:
Setpoint		●
Start/stop		●
Max. curve		●
Min. curve		●
Alarm reset		●
Controlled/uncontrolled		
Constant/proportional pressure, constant curve		
Controller constants Kp, Ti		
External setpoint signal		●
Signal relay function		
Pump number (for bus communication)		●
Stop function		
Sensor range and signal		
Duty/standby		
Operating range (min./max. speed)		
Reading via R100:		
Setpoint		●
Operating mode		●
Actual sensor value		●
Pump speed	●	
Actual power consumption	●	
Energy consumption	●	
Running hours	●	
	Setting via GENibus:	
	Setpoint	●
	Start/stop	●
	Max. curve	●
	Min. curve	●
	Controlled/uncontrolled	
	Constant/proportional pressure, constant curve	
	Reading via GENibus:	
	Setpoint	●
	Operating indication	●
	Pump status	●
	Additional functions:	
	Parallel operation	●
Clock program	●	
	Settings via external signal:	
	Setpoint	●
	Start/stop	●
	Min./max. curve via digital input	●
	Min./max. curve, external fault, Flow switch via digital input	●
	Readings via external signal:	
	Fault signal (relay)	●
Fault, Operation or Ready signal (relay)		

● Available



Fig. 7 TPE Series 1000

Technical data

Flow rate:	up to 220 gpm
Head:	up to 60 ft
Liquid temperature:	-13 to +284°F
Max. operating pressure:	145 psi
Motor sizes (single-phase):	0.33 to 1.5 hp

Construction

TPE Series 1000 pumps are based on TP pumps.

The main difference between the TP and the TPE Series 1000 pump range is the motor.

The motor of TPE Series 1000 pumps has built-in frequency converter designed to continuously regulate the pressure and the flow.

TPE Series 1000 pumps are suitable for applications where you want to retrofit a sensor in order to control e.g. the pressure, temperature, flow etc. at some arbitrary point in the system. Sensors shall be supplied by others.

For further information on construction and materials of TPE Series 1000 pumps, see page 17 and 18.

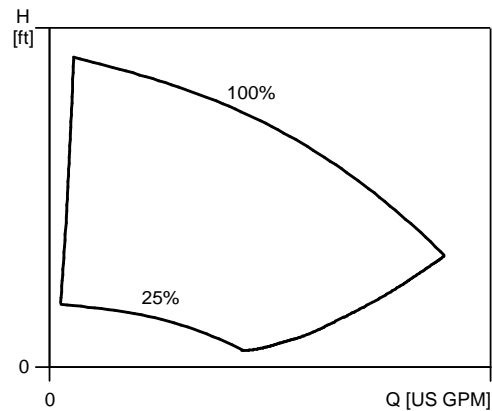
Applications

TPE Series 1000 pumps have integrated speed control for automatic adaptation of performance to current conditions.

This ensures that the energy consumption is kept at a minimum.

TPE Series 1000 pumps can operate in any duty point within the range between 25% and 100% speed.

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TM03 3609 0506

In the QH-chart the 100%-curve corresponds to the curve for a pump fitted with a standard fixed speed motor.

Depending on the nature of the application, TPE Series 1000 pumps offer energy-savings, increased comfort or improved processing.

The pumps can be fitted with sensor types meeting the requirements mentioned below:

Start/stop

External potential-free switch.

Voltage: 5 VDC.

Current: < 5 mA.

Screened cable: 0.5 - 1.5 mm² / 28-16 AWG.

Digital

External potential-free switch.

Voltage: 5 VDC.

Current: < 5 mA.

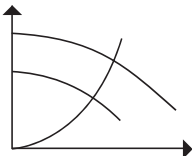
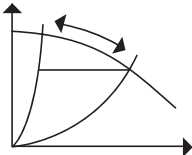
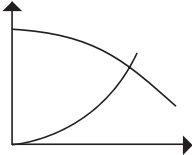
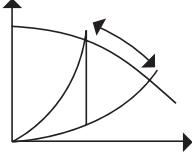
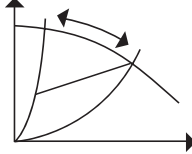
Screened cable: 0.5 - 1.5 mm² / 28-16 AWG.

Setpoint signals

- Potentiometer
0-10 VDC, 10 kΩ (via internal voltage supply).
Screened cable: 0.5 - 1.5 mm² / 28-16 AWG.
Maximum cable length: 100 m.
- Voltage signal
0-10 VDC, R_i > 10 kΩ.
Tolerance: +0%/-3% at maximum voltage signal.
Screened cable: 0.5 - 1.5 mm² / 28-16 AWG.
Maximum cable length: 500 m.
- Current signal
DC 0-20 mA/4-20 mA, R_i = 175 Ω.
Tolerance: +0%/-3% at maximum current signal.
Screened cable: 0.5 - 1.5 mm² / 28-16 AWG.
Maximum cable length: 500 m.
Power source for sensor: 24 VDC is available from VFD. Max 40 mA

TPE Series 1000 pumps

The charts below show possible control modes of TPE Series 1000 pumps in different applications.

Control mode	Application
Constant curve	
	Single-pipe heating systems. Systems with three-way valves. Heating and cooling surfaces. Chiller pumps.
Constant differential pressure	
	Systems with two-way valves. (Sensor is needed)
Temperature control	
	Single-pipe heating systems. Systems with three-way valves. Cooling towers. Chiller pumps. Domestic hot water recirculation systems. (Sensor is needed)
Constant flow	
	Heating and cooling surfaces. Cooling towers. Flow filters. (Sensor is needed)
Proportional differential pressure (measured)	
	System with two-way valves. (Differential pressure sensor is located in the system) (Sensor is needed)

Control options

Communication with TPE Series 1000 pumps is possible via

- a central building management system
- remote control (Grundfos R100) or
- a control panel.

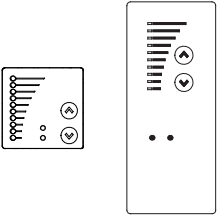
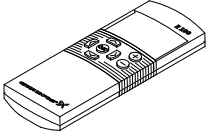
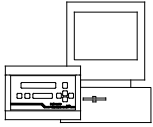
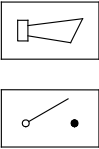
The purpose of controlling a TPE Series 1000 pumps is to monitor and control the pressure, temperature, flow and liquid level of the system.

For further information on control options of TPE pumps, see page 25.

TPE Series 1000 pumps

E-circulators VersaFlo® TPE

Overview of Functions

	E-pump functions	TPE Series 1000, without sensor
	Setting via control panel:	
	Setpoint	●
	Start/stop	●
	Max. curve	●
	Min. curve	●
	Alarm reset	●
	Constant/proportional pressure	
	Reading via control panel:	
	Setpoint	●
	Operating indication	●
Fault indication	●	
	Setting via R100:	
	Setpoint	●
	Start/stop	●
	Max. curve	●
	Min. curve	●
	Alarm reset	●
	Controlled/uncontrolled	●
	Constant/proportional pressure, constant curve	●
	Controller constants Kp, Ti	●
	External setpoint signal	●
	Signal relay function	●
	Pump number (for bus communication)	●
	Stop function	
	Sensor range and signal	●
	Duty/standby	
	Operating range (min./max. speed)	●
	Reading via R100:	
	Setpoint	●
	Operating mode	●
	Actual sensor value	●
Pump speed	●	
Actual power consumption	●	
Energy consumption	●	
Running hours	●	
	Setting via GENIBus:	
	Setpoint	●
	Start/stop	●
	Max. curve	●
	Min. curve	●
	Controlled/uncontrolled	●
	Constant/proportional pressure, constant curve	
	Reading via GENIBus:	
	Setpoint	●
	Operating indication	●
Pump status	●	
Additional functions:		
Parallel operation	●	
Clock program	●	
	Settings via external signal:	
	Setpoint	●
	Start/stop	●
	Min./max. curve via digital input	●
	Min./max. curve, external fault, Flow switch via digital input	
Readings via external signal:		
Fault signal (relay)		
Fault, Operation or Ready signal (relay)	●	

● Available