6.2.4 Changing from recommended to alternative pump setting

Heating systems are relatively slow systems that cannot be set to the optimum operation within minutes or hours.

If the recommended pump setting does not give the desired distribution of heat in the rooms of the house, change the pump setting to the shown alternative.

6.2.5 Selecting the control modes

Proportional pressure

We recommend proportional-pressure mode in variable flow systems with relatively large pressure losses in the distribution pipes such as:

- two-pipe heating systems with thermostatic valves and long distribution pipes
- two-pipe heating systems with thermostatic valves and high pressure losses in system parts with total flow
- primary circuit pumps in systems with large pressure losses in the primary circuit.

Note: Proportional-pressure mode is not recommended in heating systems that includes an automatic bypass valve to ensure a minimum flow for the heating appliances.

Constant pressure

We recommend constant-pressure mode in variable flow systems with relatively small pressure losses in the distribution pipes such as:

- two-pipe heating systems with thermostatic valves and dimensioned for natural circulation (former gravity systems)
- two-pipe heating systems with thermostatic valves and low pressure losses in system parts with total flow
- one-pipe heating systems with thermostatic valves or pipe balancing valves
- underfloor heating systems with zone valves
- primary circuit pumps in systems with small pressure losses in the primary circuit.

Constant curve

We recommend constant-curve mode in constant-flow systems, where both a constant flow rate and a constant head are required, such as:

- heat surfaces
- replacement for uncontrolled circulator pumps, for instance integrated in boilers.

6.3 Control signal

The pump can be controlled via a digital low-voltage pulse-width modulation (PWM) signal.

The square-wave PWM signal is designed for a 100 to 4,000 Hz frequency range. The PWM signal is used to select the speed (speed command) and as feedback signal. The PWM frequency on the feedback signal is fixed at 75 Hz in the circulator pump.

For instructions on how to set the connection, see section *7.1 Setting the PWM input signal*.

Duty cycle

d % = 100 x t/T

Example	Rating
T = 2 ms (500 Hz)	U_{iH} = 4-24 V
t = 0.6 ms	U_{iL} ≤ 1 V
d % = 100 x 0.6 / 2 = 30 %	I_{iH} ≤ 10 mA (depending on U_{iH})

Example

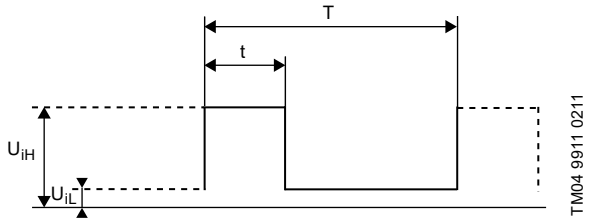

Fig. 15 PWM signal

Abbreviation	Description
T	Period of time [sec.]
d	Duty cycle [t/T]
U_{iH}	High-level input voltage
U_{iL}	Low-level input voltage
I_{iH}	High-level input current

6.3.1 Interface

The pump's interface consists of an electronic part connecting the external control signal to the circulator pump. The interface translates the external signal into a signal type that the microprocessor can understand.

In addition, the interface ensures that the user cannot get into contact with dangerous voltage if touching the signal wires when power is connected to the circulator pump.

Note: "Signal ref." is a signal reference with no connection to protective earth.

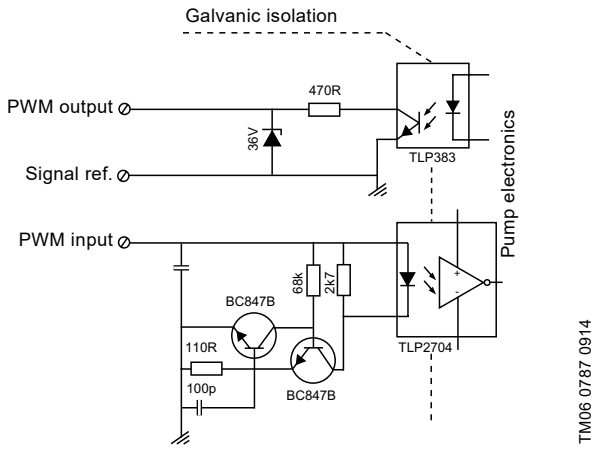

Fig. 16 Schematic drawing, interface