

15W0073A200 - R01

Pump Monitoring with Pressure PID Control when using a Sinus M VFD

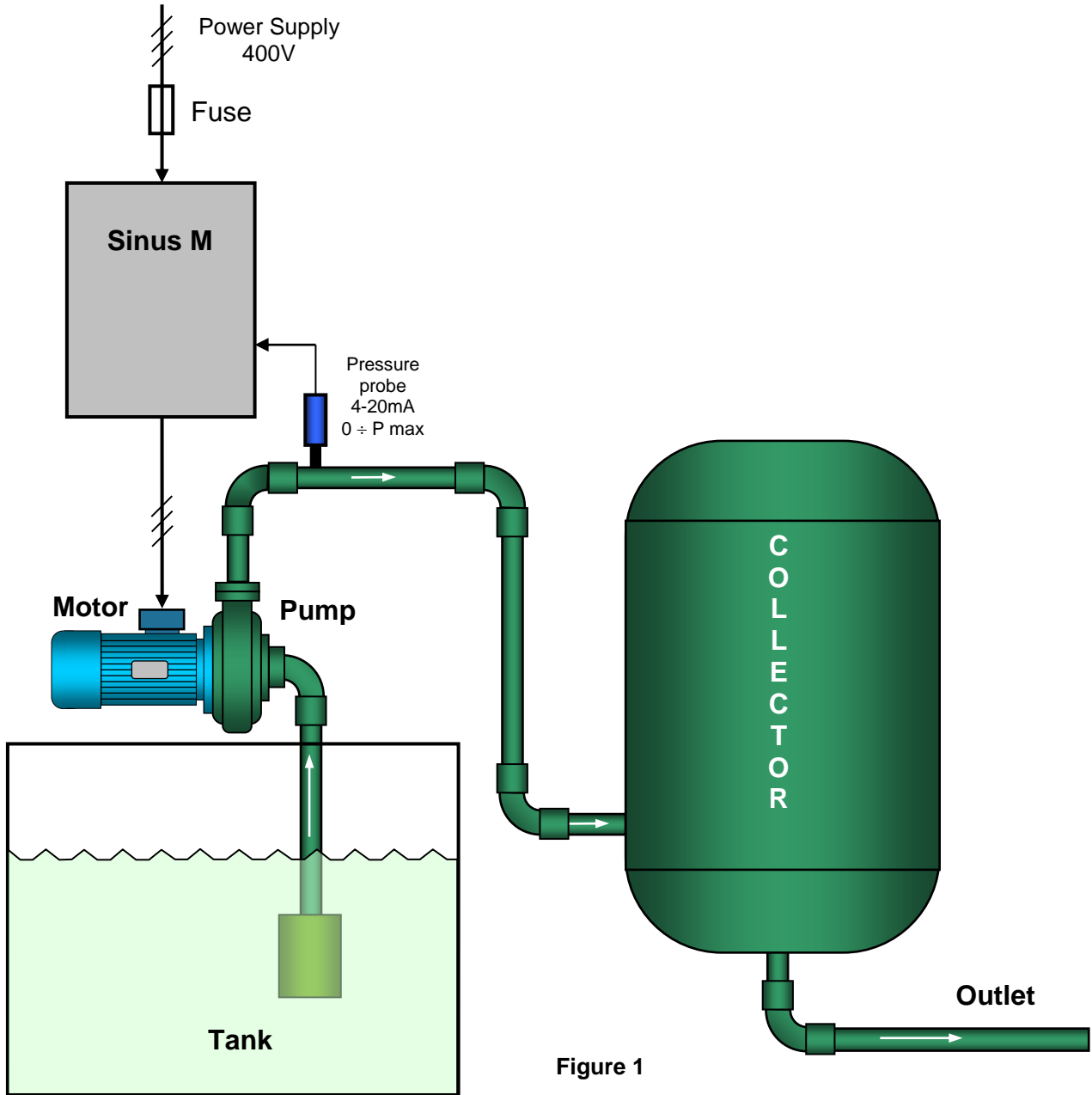


Figure 1

Electrical Schematic (2-wire Passive Sensor)

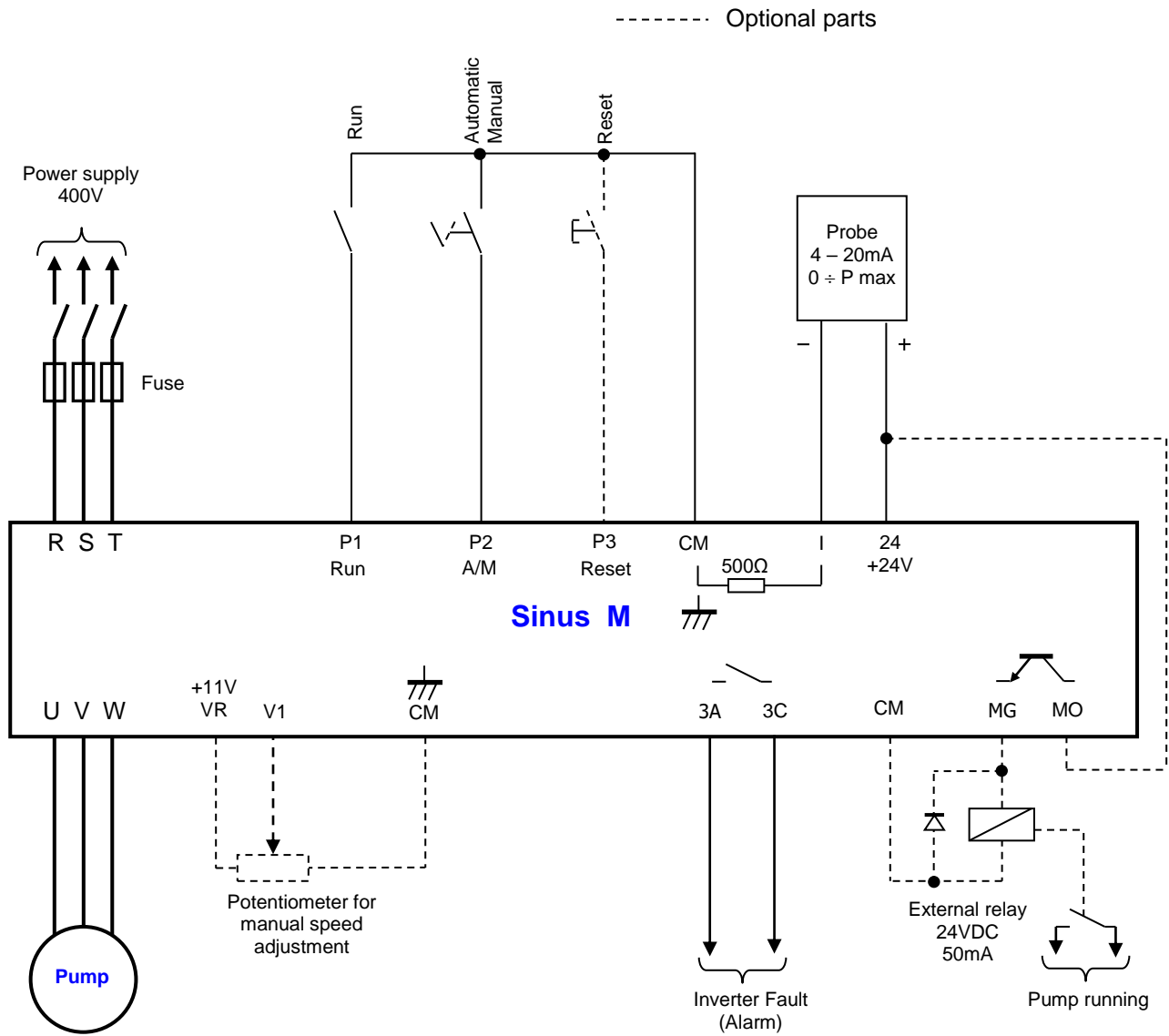


Figure 2

Electrical Schematic (3-4-wire Active Sensor)

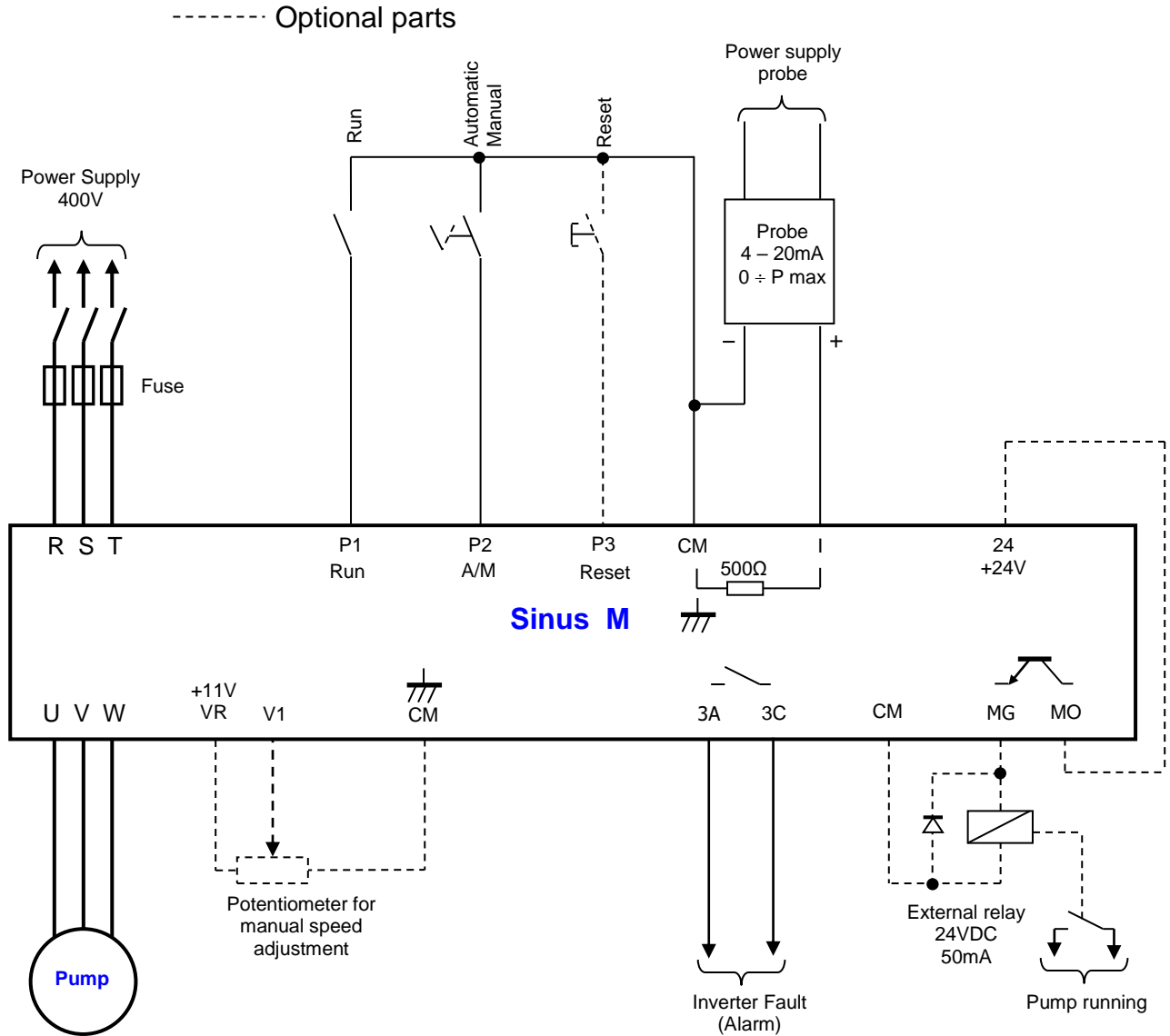


Figure 3

Programming Example

ACC=Acc ramp	5sec	Acceleration
DEC=Dec ramp	10sec	Deceleration
F21=Max frequency	50Hz	
H30=Rated motor power	...KW	
H33=Rated motor current	...A	
H49=PID control select	1	
H50=PID feedback	select 0	for feedback from input I
H51=proportional	adjust based on plant features
H52=integral	adjust based on plant features
H55=Max PID	50Hz	value of max speed implemented by PID controller
H56=Min PID	30Hz	value of min speed implemented by PID controller
H57=PID Ref	0	Keypad Setpoint source for the desired pressure level
H59=Inverse PID	0 / 1	for PID action inversion
I18=Multi-function input terminal P2	28	Input allowing disabling the PID controller (open loop 1)
FRQ3=Speed ref	3	for reference from potentiometer to input V1

The parameters below set the Sleep function (automatic power off of the pump when the pressure level is reached). Make sure that H64 is set greater than H55 to prevent the automatic system from disabling.

H61=Sleep delay time	30sec	Pump will automatically stop when this time is over
H62=Sleep frequency	35Hz	Automatic pump stop trip frequency
H63=Sleep enable	2%	Pressure error for automatic pump reactivation
I89 =PIDscaleMin	0,0 %	
I90 =PIDscaleMax	100,0 %	

Description of operation

The diagrams above illustrate pressure control inside a collector with feedback from 4 – 20mA Bar probe.

The pressure setpoint is set via keypad. Change the setpoint to adjust pressure from 0 to the maximum allowable value for the transducer. Pressure is kept constant based on the plant demand.

If pressure settles down at a higher value than the setpoint value, due to a lower demand, the pump will set a minimum speed (parameter H56) then it will automatically stop if operation at minimum speed lasts longer than the time set in parameter H61, below the sleep speed value (parameter H62).

When pumping is resumed and pressure in the plant drops below the preset value, with an error equal to or higher than H63, the pump will promptly restart and will restore the pressure level keeping it constant via the internal PID.

The example given in this document makes it possible to disable the automatic PID control and to manually control the pump speed via the "Auto/manual P2" selector. When in manual mode and pressure is adjusted via keypad, P3 selector will act as a simple speed regulator from 0 to maximum speed.

Important:

The diagrams and the values set in the parameters above are given as an indication only. They may vary based on the plant requirements and construction features. Hence the installer is responsible for the proper operation of the plant.

The installer is responsible for observing the safety regulations in force and applying the state-of-the-art rules. Please refer to the User Manual available for download from santerno.com.