

15W0176B200 R02 29/07/2022
Pump Drive with PID Pressure Control through Sinus H Drive

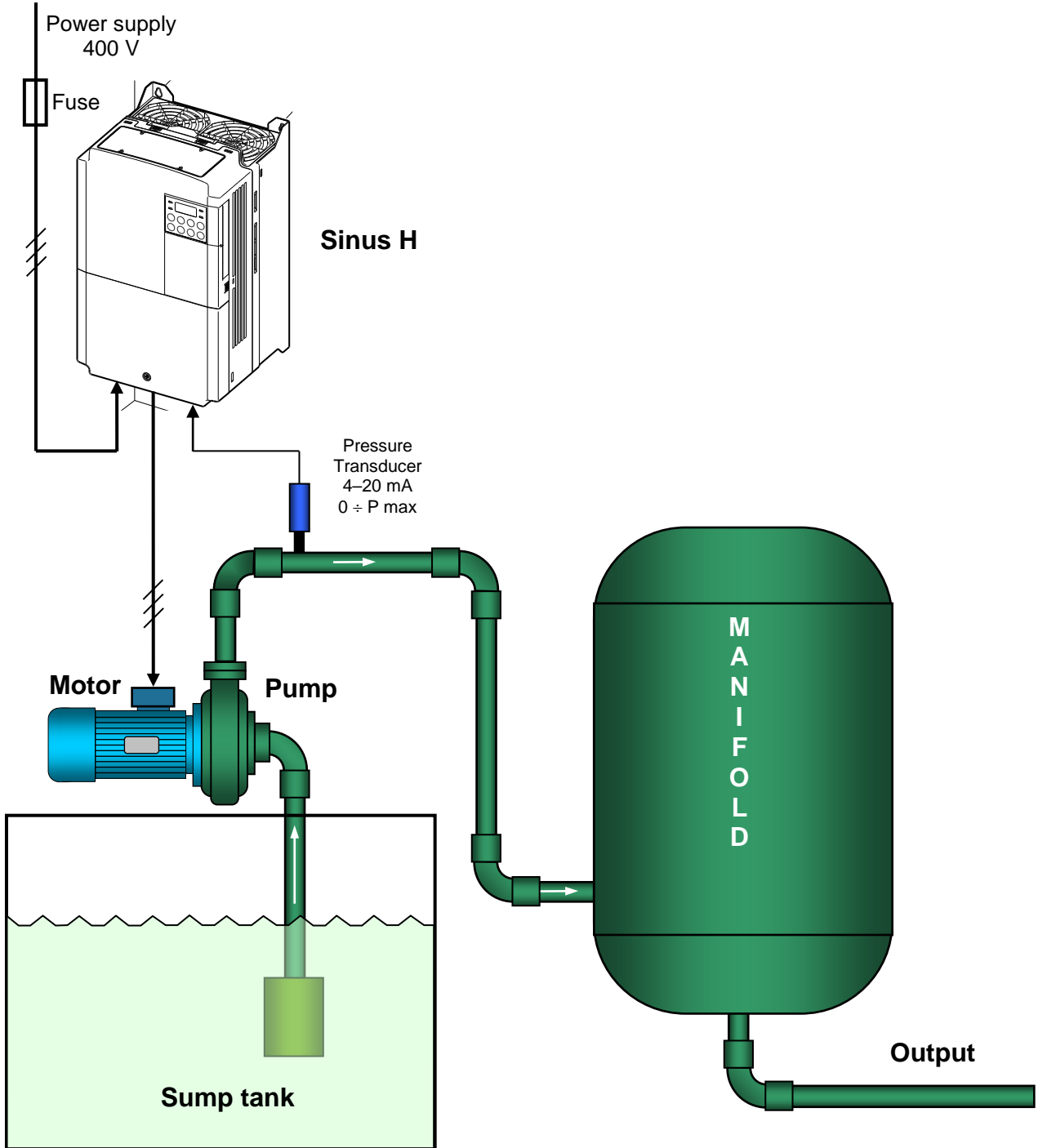


Figure 1

Circuit diagram (passive sensor – 2 wires)

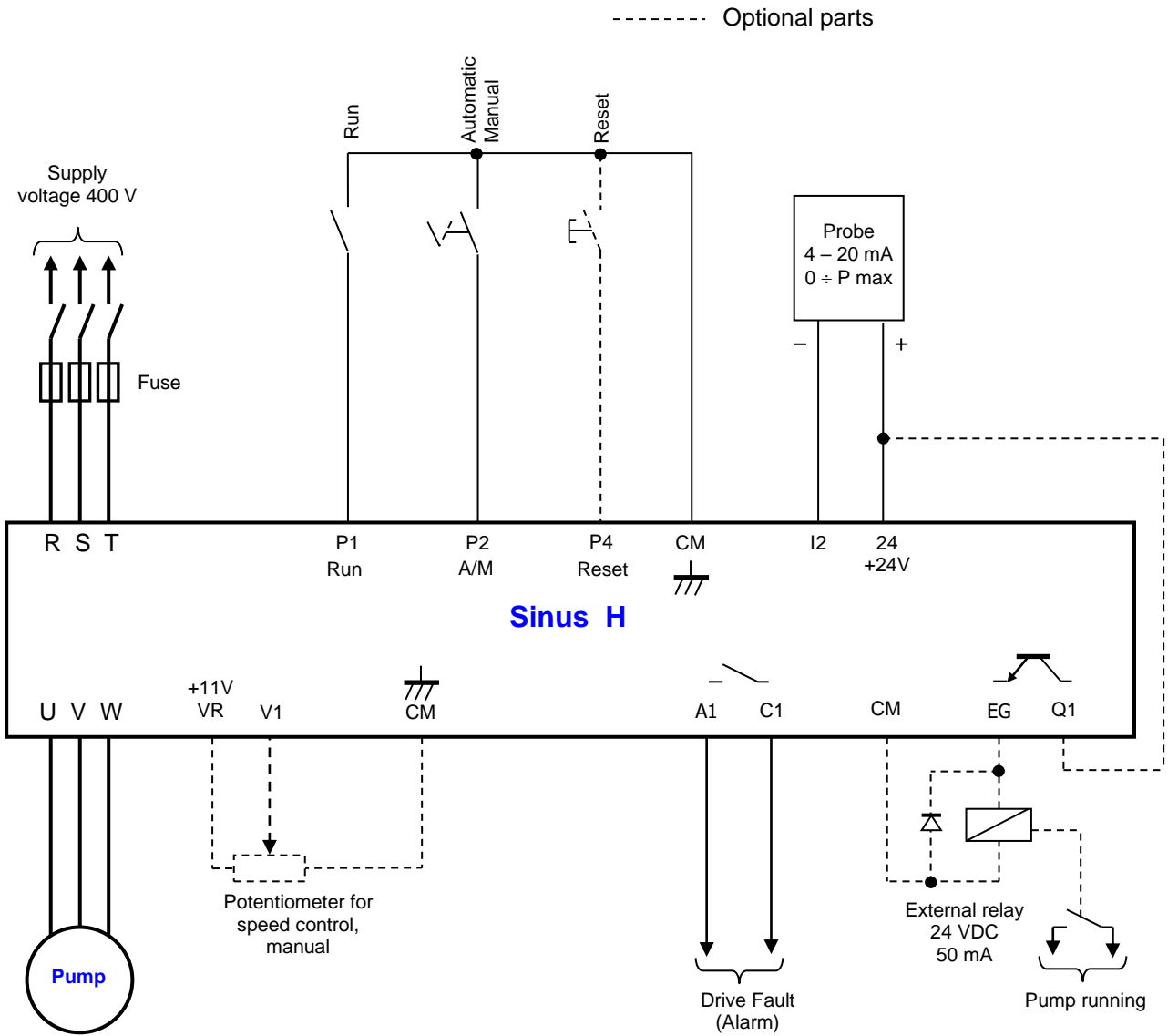


Figure 2

Circuit diagram (passive sensor – 3-4 wires)

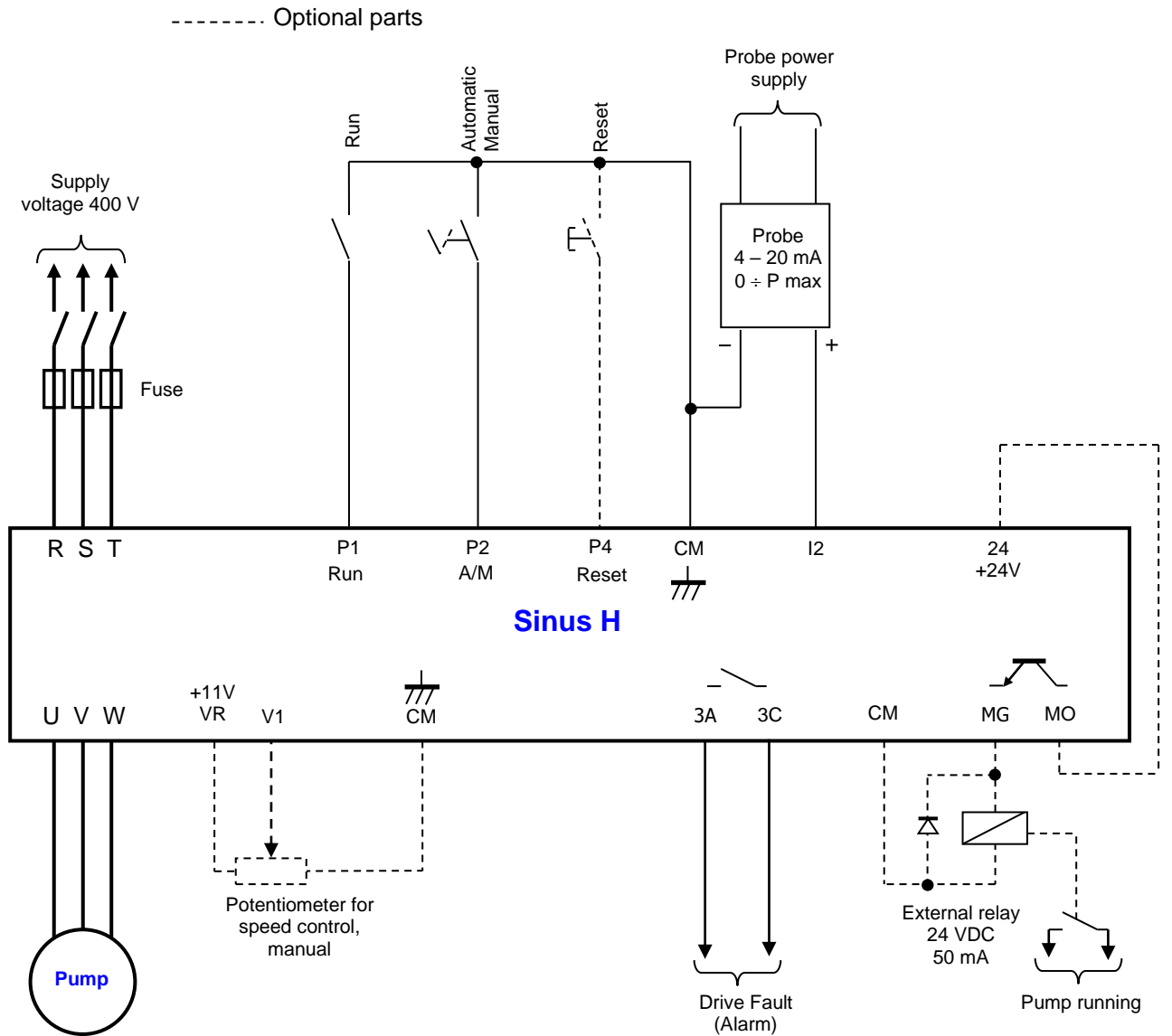


Figure 3

Programming example

ACC = Acc ramp	2 sec	Acceleration
DEC = Dec ramp	2 sec	Deceleration
dr20 = Max Drive frequency	50 Hz	
dr14 = Motor rated power	.....kW	
bA07 = v/f pattern	1	Quadratic
bA11 = Number of poles	.....	.....
bA13 = Motor rated current	.....A	
AP01 = Activates PID	2	
AP17 = Shows PID reference%	
AP18 = Shows PID feedback%	
AP19 = Sets PID reference	.....%	Set as a percentage set-point value
AP20 = Source of PID reference	0	Keypad

Warning: In order to set AP20=1 (V1), you need to set AP21 to a value different from 0 first, otherwise any change will be inhibited by the OL function, as AP20 and AP21 cannot share the same input.

AP21 = Select feedback input	3	for feedback from input "I" (input impedance 250 Ω)
AP22 = Proportional	.....	Calibrate according to the system specs
AP23 = Integral	.....	Calibrate according to the system specs
AP27 = PID filter	.....
AP28 = PID mode	1	Normal PID
AP29 = PID max	50 Hz	Max speed value implemented by the PID controller
AP30 = PID min	30 Hz	Min speed value implemented by the PID controller
AP31 = PID reverse	0/1	For PID action reversing
In66 = P2 input function	23	This input allows disabling the PID controller (open loop 1)
FRQ = Open-loop speed reference2		For speed referencing from the potentiometer on input V1

In order to activate the "sleep" function (automatic switching-off of the pump after reaching the target pressure) use the following parameters, making sure that the value of AP38 is higher than AP30, to avoid the disabling of the automatic system.

AP37 = Sleep time	30 sec	Time before the pump automatically stops
AP38 = Sleep level	35 Hz	Frequency at which the pump automatically stops
AP39 = Wake-up level	35%	Pressure value at which the pump is automatically reactivated

Theory of Operation

The diagrams shown in the previous pages represent the pressure control inside a manifold with feedback from a 4–20mA transducer. The pressure can be set via the keypad. The manifold pressure setting ranges from 0 to the max value of the transducer scale, and can be kept constant even when the demand fluctuates.

If the pressure exceeds the set value, because of a reduction in the consumption, the pump will adjust to a minimum speed (AP30) and then automatically stop (if this condition is longer than the time value set in AP37) at a lower speed than the sleep speed (AP38).

As soon as the consumption is resumed and the system pressure is lower than the value set in parameter AP39, the pump will instantly restart and restore its pressure value, keeping it constant by means of the PID controller.

This example allows for the exclusion of the automatic PID controller, in order to manually manage the pump speed, by operating the P2 Automatic/Manual selector. When controlling the Drive in manual mode, it serves as a normal speed controller, allowing to adjust the speed value from 0 to the max speed.

Note:

The above-mentioned diagrams and parameter values represent a mere example of how the application can be used, and they may be modified according to the User requirements and the technical specifications of the system. Therefore, it is the installer's responsibility to ensure a correct implementation. Moreover, it is the installer's responsibility to comply with the applicable safety regulations, and to provide a state-of-the-art installation. Please refer to the Product Application Manual for further information.