PIM-PA-01 Pump Application Interface

1. Overview

The Pump Application Interface expands the soft starter's input and output functionality and is ideal for applications where greater control and feedback are required. The interface provides three digital inputs and one PT100 sensing input, which can monitor system conditions and shut the motor down safely if an unwanted condition occurs.

The Pump Application Interface is easy to install and configure, and no special tools or additional software are required. The interface is powered through the soft starter's serial port.

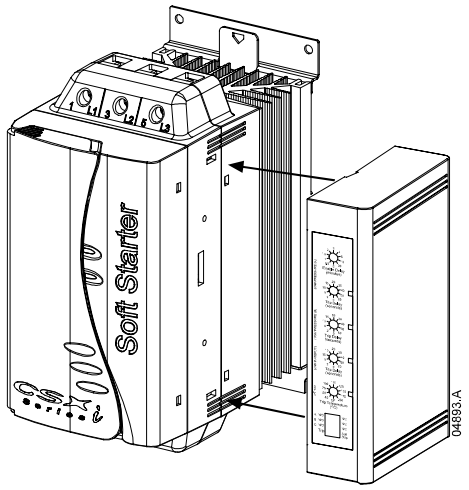
The Pump Application Interface has been designed for pumping applications but can be easily adapted to any situation requiring input/output expansion.

2. Installation

Install the Pump Application Interface using the following procedure:

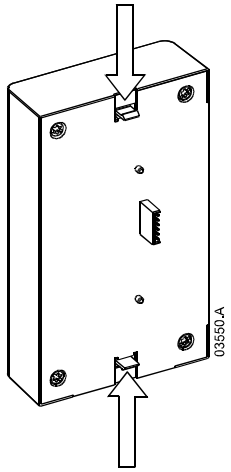
1. Remove control power and mains supply from the soft starter.
2. Attach the interface to the soft starter as illustrated below.
3. Connect the interface to field wiring.
4. Adjust the interface's settings as required.
5. Apply control power to the soft starter.

CSX Series:
Plug the interface onto the side of the soft starter.



Remove the Pump Application Interface using the following procedure:

1. Remove control power and mains supply from the soft starter.
2. Disconnect all field wiring from the interface.
3. Push a small flat-bladed screwdriver into the slots at the top and bottom of the interface and depress the retaining clips.
4. Pull the interface away from the soft starter.



CAUTION
Remove mains and control voltage from the soft starter before attaching or removing accessories. Failure to do so may damage the equipment.

2. Inputs

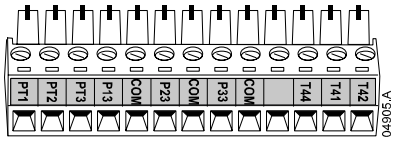
The Pump Application Interface has three digital inputs which can be directly connected to external inputs such as pressure switches, flow switches, limit switches or PLC outputs, and one PT100 input which can be directly connected to a temperature sensor. When an input activates, the interface will trip the soft starter. To resume normal operation, the soft starter must be reset.

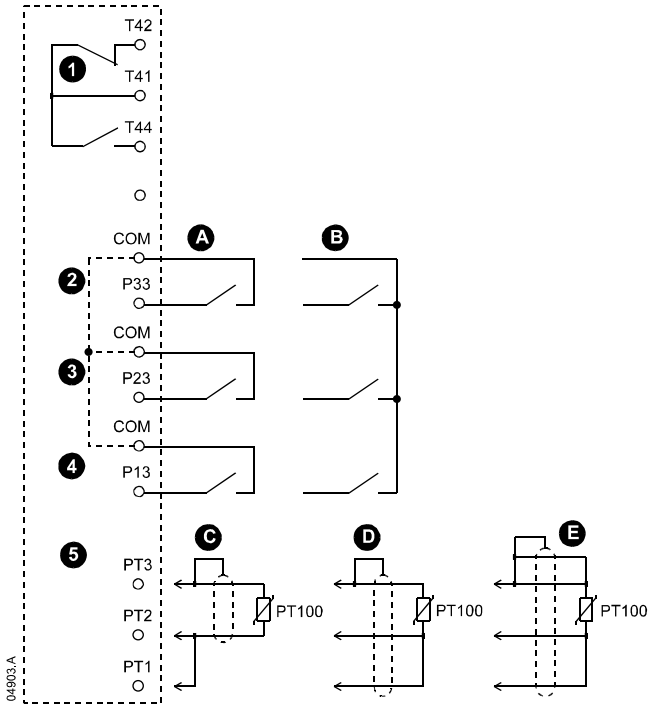
Each input is designed for a specific function.

- Input A: Low pressure
- Input B: High pressure
- Input C: Low water
- PT100: Temperature sensing

3. External Connections

The input terminals are located on a removable terminal block at the base of the interface:

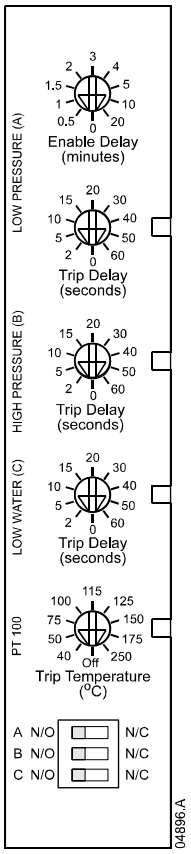




1	Trip output
2	Low water level input
3	High pressure input
4	Low pressure input
	A: Two-wire connection
	B: Shared common connection
5	PT100 input
	C: Two-wire connection
	D: Three-wire connection
	E: Four-wire connection

NOTE
Remote input connections are still required to control the soft starter.

4. Configuration



Changes to the settings take effect immediately.

Setting	Active	Details
Low pressure enable delay	Run[1]	Delay between the soft starter entering run state and the interface starting to monitor the low pressure input (minutes).
Low pressure trip delay	Run[1]	Delay between the input activating and the selected pressure trip action (seconds).
High pressure trip delay	Run[1]	
Low water trip delay	Always	
PT100 trip temperature	Always	The interface will trip the soft starter within 2 seconds of the PT100 temperature reaching the selected level.
A: Low pressure input logic		N/O: open = healthy, closed = tripped N/C: closed = healthy, open = tripped
B: High pressure input logic		
C: Low water input logic		

[1] Input is active when the motor reaches full voltage.

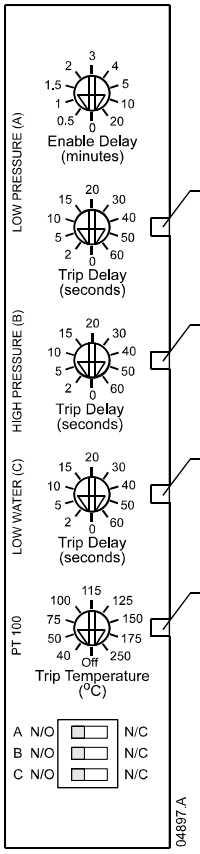
PT100 Trip Temperature

The PT100 input will trip the interface when resistance exceeds the following values:

Temperature	40 °C	50 °C	75 °C	100 °C	115 °C	125 °C	150 °C	175 °C	250 °C
Resistance (± 1Ω)	116 Ω	119 Ω	125 Ω	138 Ω	145 Ω	149 Ω	159 Ω	169 Ω	198 Ω
Typical application	Submersible pump			Class A motor	Class E motor	Class B motor	Machine or Class F motor	Machine or Class H motor	Machine

Trip temperatures of 100 °C to 175 °C are 5 °C below the corresponding motor insulation class.

5. LED Feedback



The four LEDs on the front of the interface indicate the state of each input.

LED	Function
Low pressure	On = Input closed Off = Input open Flashing = Tripped
High pressure	
Low water	
PT100	On = PT100 connection healthy Off = PT100 input disabled Flashing = Tripped

6. Trip Output

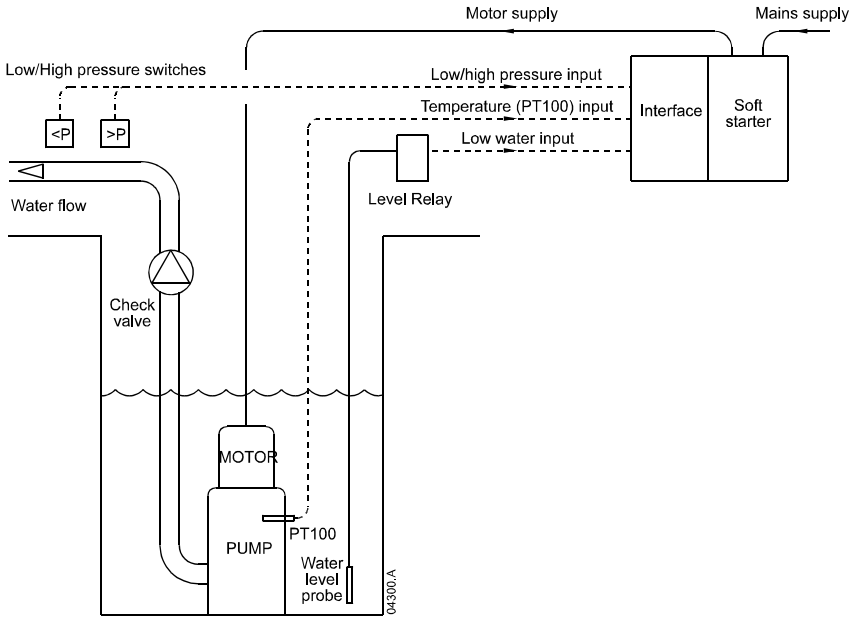
When an input activates, the associated LED flashes and the trip output changes state. The soft starter will trip on network communications failure. To resume normal operation, the soft starter must be reset.

The interface's trip output will also change state to indicate any other trip on the soft starter.

7. Application Examples

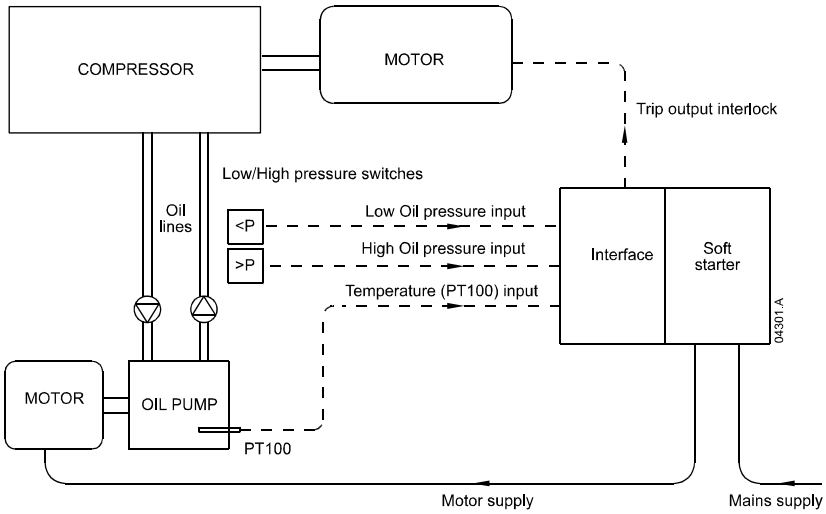
Submersible Pump

The interface can be connected to high and low pressure switches, a PT100 to monitor pump temperature, and a level relay to protect against low water. This provides a simple, integrated pump monitoring system without any extra components such as timers, relays and temperature monitoring devices.



Compressor Oil Pump

The interface can be used on a compressor oil pump system, to monitor conditions such as oil line pressure and oil temperature. Interlocking the trip output with the compressor motor means that the compressor is safely shut down when a fault occurs, preventing damage to the system.



Safety Interlocking System

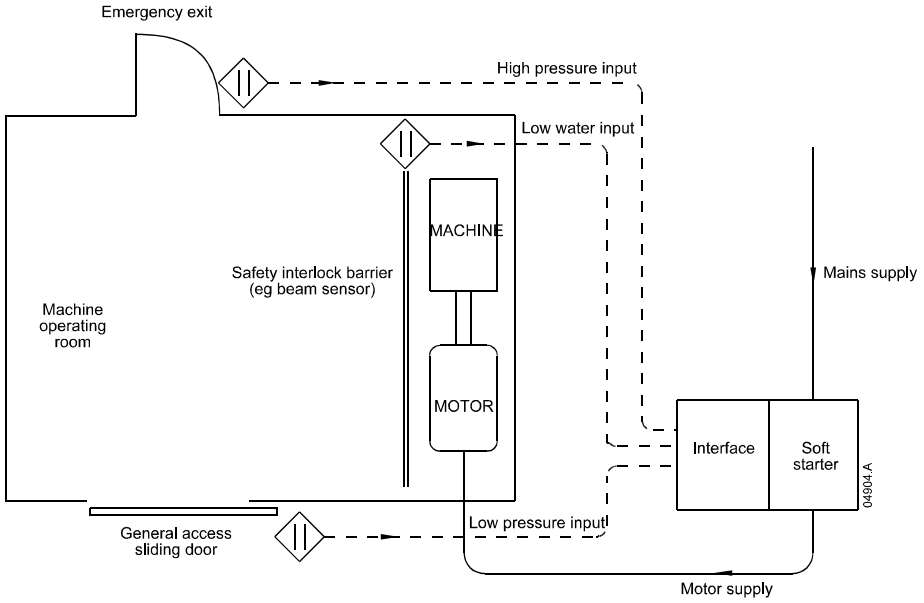
The Pump Application Interface is not restricted to pumping applications only.

In this example, the Pump Application Interface is used on a safety interlock control system.

The low pressure input is directly connected to a limit switch on a general access sliding door. The input activates if the sliding door is left open, which causes a trip and stops the motor and machine. An initial delay allows the door to open and close for short periods to allow entry and exit.

The high pressure input is directly connected to a limit switch on an emergency exit door. The input activates immediately if this door is opened, which causes a trip and stops the motor and machine.

The low water input is directly connected to a safety interlock barrier device. When the device operates, the input activates which causes a trip and stops the motor and machine.



8. Specifications

Enclosure	
Dimensions	35 mm (W) x 157 mm (H) x 90 mm (D)
Weight	250 g
Protection	IP20

Mounting
Spring-action plastic mounting clips (x 2)

Connections	
Soft starter	6-way pin assembly
Inputs/Output	Screw and plug type terminals
Maximum cable size	1.5 mm^2

Settings	
Trip settings	10-position rotary switches
Input logic and trip response	3-way dip switch

Power Supply
Internally powered from soft starter
External power source not required

Inputs	
Digital inputs	
steady state	voltage free, 8 mA maximum at 24 VDC
cable length	30 m maximum (unshielded)
PT100 input	
sensing current	1 mA maximum
accuracy	± 2°C
minimum instantaneous trip point	92.2 Ω at -20 °C
open circuit protection	included
connection	2, 3 or 4 wire
cable length	150 m maximum (twisted pair/shielded)

Outputs	
Relay type	single pole, changeover
Capacity	6 A @ 30 VDC resistive, 2 A @ 400 VAC, AC11

Environmental	
Pollution degree 3	
Operating temperature	-5 °C ~ +60 °C
Relative humidity	maximum 95% non-condensing

Certification	
C✓	IEC 60947-4-2
CE	IEC 60947-4-2