7. Operating mode

7.1 Slave proportional mode

7.1.1 Applications

Control from external controller or manually controlled potentiometer.

7.1.2 Operation

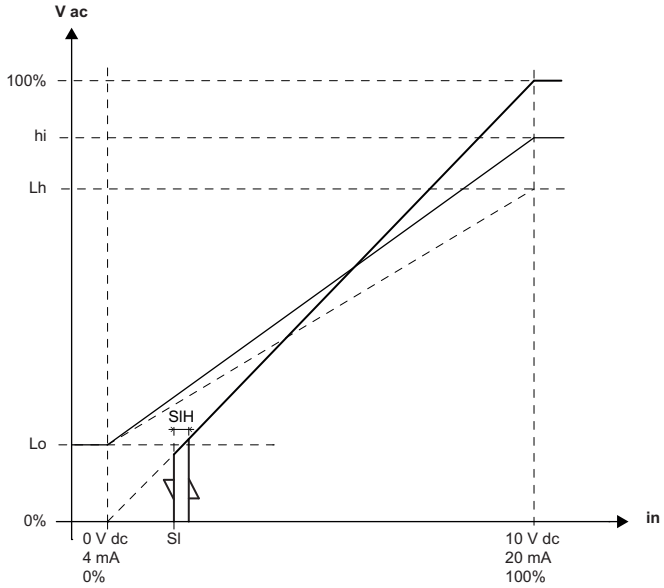
Three-phase output voltage varies in proportion to the prevalent input. The minimum speed limit, **Lo** is active and the maximum, **hi**, with forcing at 0% and relative hysteresis (**So** + **io**). Regulation jumps (**Jh + JL1**) are enabled, used to avoid particularly noisy zones.

***NOTICE**: passing from direct mode to indirect mode, the setting of parameter **So** remains unchanged. Manually change the value as suitable for the reverse mode.*

If the maximum night limit of % RPM **Lh** is active (switch 3 of DIP switch SW1 = on), **Lh** is prevalent over **Hi** only if the value is lower.

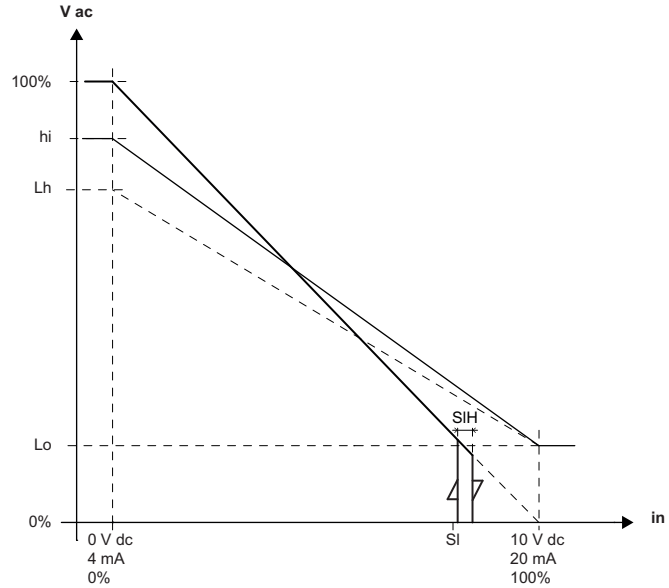
7.1.3 Direct Slave control

Switch 2 of DIP switch SW1 = off



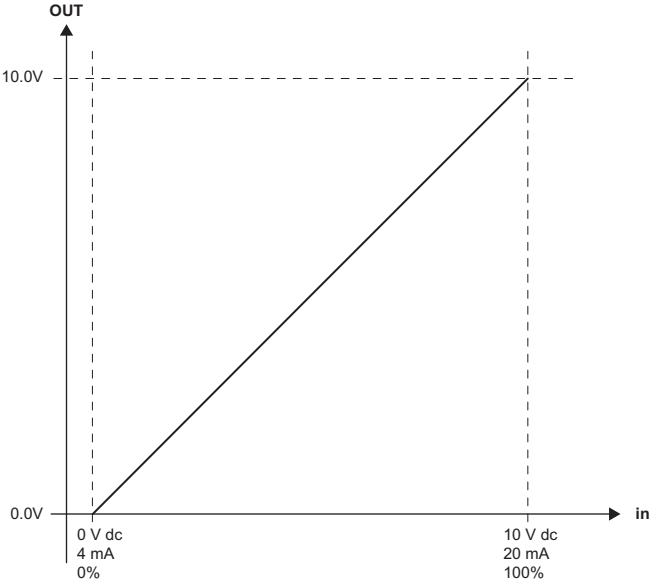
7.1.4 Inverse Slave control

Switch 2 of DIP switch SW1 = on



7.1.5 Control output OUT 0-10 V

The output signal is directly proportional to the input signal and does not depend on the position of switch 2 of DIP switch SW1 or on the limit value **Lo**, **Lh** e **hi**.



7.2 Master proportional mode

7.2.1 Applications

Signals from temperature sensors or transducers.

7.2.2 Operation

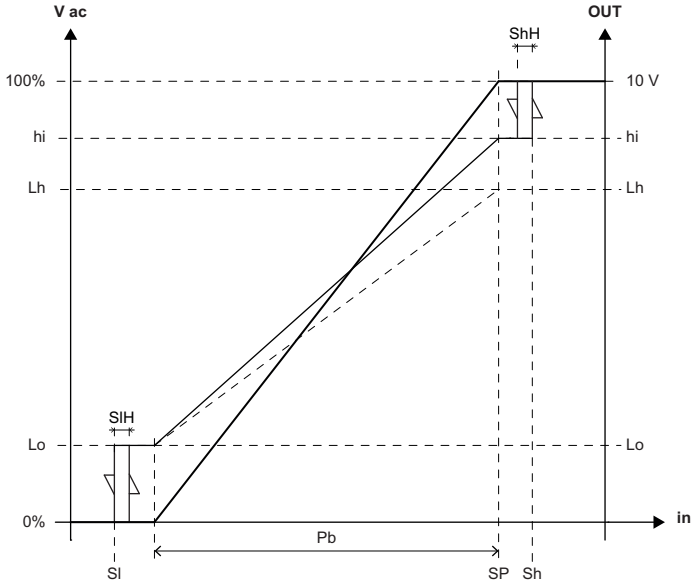
The controller manages fans with its setpoint (**SP**) and reference proportional band (**Pb**). The minimum (**Lo**) and maximum (**hi**) speed limits are enabled, with forcing and relevant hysteresis at 0% (**So** + **io**/) and 100% (**Sh** + **ih**/). The control jumps are active (**Jh + JL1**), used to avoid particularly noisy zones (see "Speed band" on page 37).

If the night limit of % RPM **Lh** is active (switch 3 of DIP switch SW1 = on), **Lh** is prevalent over **hi** only if the value is less.

The analog output **OUT** is directly proportional to the output voltage and therefore depends on the position of DIP switch SW1 and the limit values **Lo**, **Lh**, and **hi**.

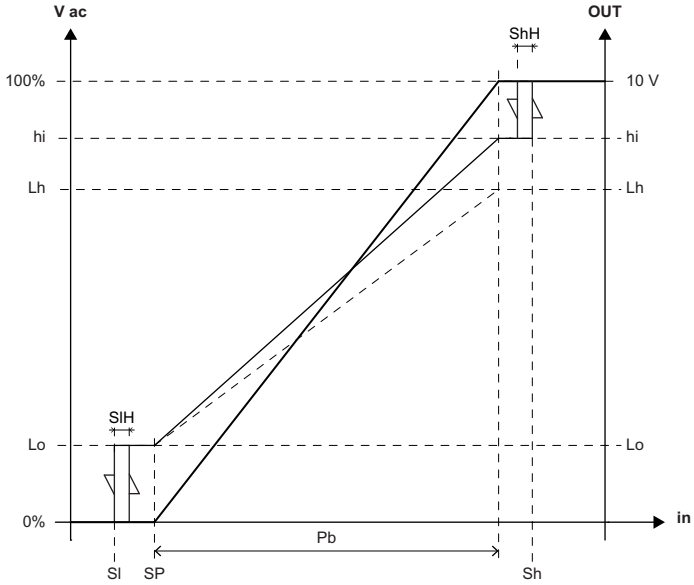
7.2.3 Direct Master control, SP at the maximum limit (default)

Switch 1 DIP switch SW1 = off, switch 2 DIP switch SW1 = off



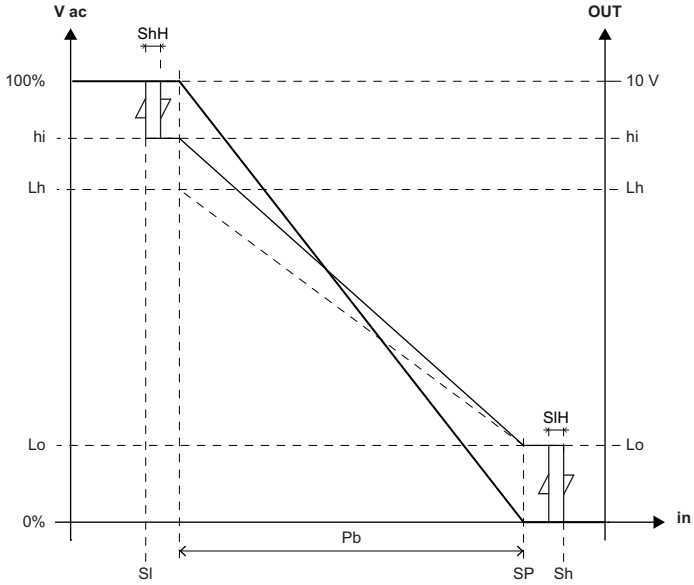
7.2.4 Direct Master control, SP at the minimum limit

Switch 1 DIP switch SW1 = on, switch 2 DIP switch SW1 = off



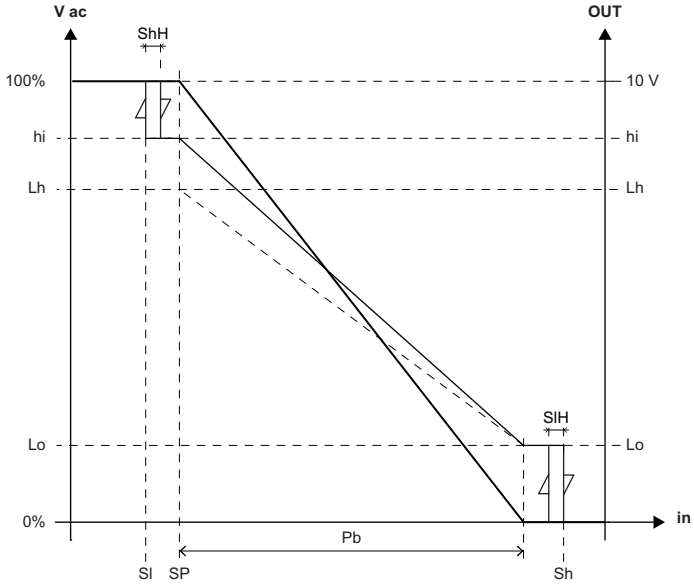
7.2.5 Reverse Master control, SP at the maximum limit

Switch 1 DIP switch SW1 = off, switch 2 DIP switch SW1 = on



7.2.6 Reverse Master control, SP at the maximum limit

Switch 1 DIP switch SW1 = on, switch 2 DIP switch SW1 = on



7.3 Master PID mode

7.3.1 Applications

Signals from temperature sensors or transducers.

7.3.2 Operation

The three-phase output voltage varies to keep the prevalent input at the setpoint value. On the other hand, the analog output uses the same **IN** input but with a specific setpoint and proportional band.

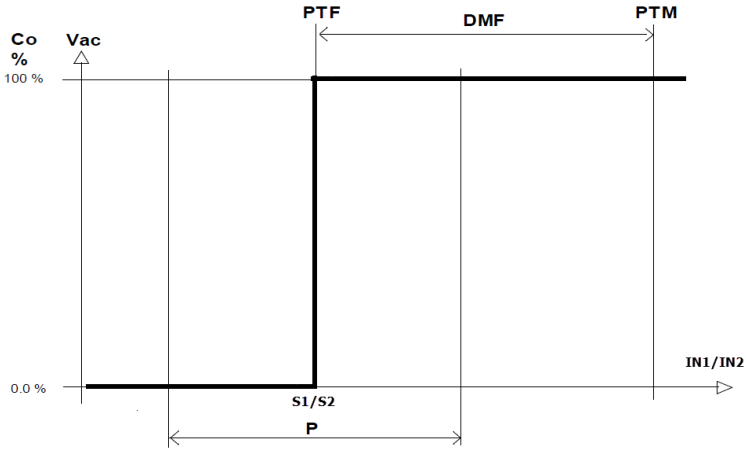
***Note**: for correct PID regulation operations, accurately set the specific parameters*

At full potential, meaning once the settlement transitions are depleted and far from the minimum (**Lo**) and maximum **(hi**) limits, the PID controller keeps at the set setpoint (**SP**) the value of the magnitude measured by the prevalent transducer (**IN1** or **IN2**). Fan control (**Co**) can have a free value that ranges from 0% to 100%, according to that required to keep the set work point.

During transitions, if the prevalent input value (**IN1** or **IN2**) moves around the setpoint (**SP**) but remains within the proportional band (**P**), fan control (**Co**) varies from 0% to 100% to return the input value (**IN1** or **IN2**) to the set setpoint (**SP**).

If, instead, the prevalent input value (**IN1** or **IN2**) exits the proportional band (**P**), fan control gradually moves to 0%, or 100%, according to that needed.

The minimum (**Lo**) and maximum (**hi**) speed limits are enabled, with forcing and relevant hysteresis at 0% (**So** + **io**/) and 100% (**Sh** + **ih**/). Regulation jumps (**Jh + JL1**) are enabled, used to avoid particularly noisy zones.



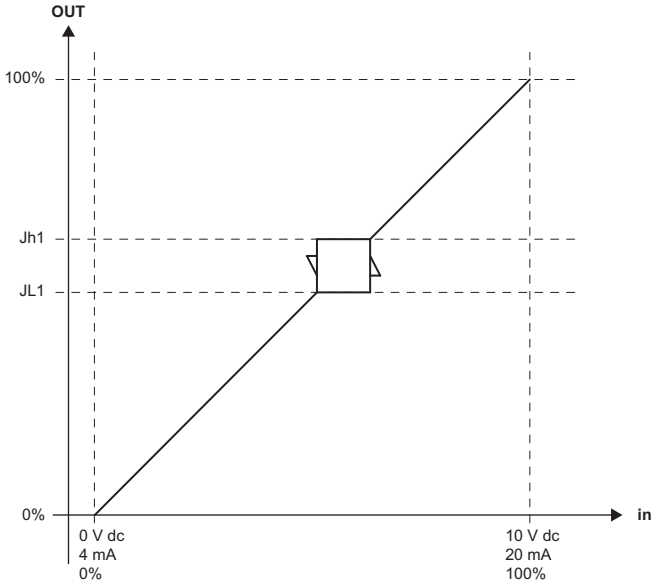
Key

Variable	Description
PTF	Minimum working temperature or pressure restricted by system conditions. Set the setpoint to the same value as PTF to obtain greater compressor energy savings
PTM	Maximum working temperature or pressure restricted by system conditions.
DMF	Temperature or pressure difference (PTM-PTF). Movement of the input from PTF to PTM occurs due to an increase in ambient temperature.

7.4 Speed band

7.4.1 Control jumps

Control jumps (**Jh1** + **JL1**) can be defined to avoid particularly noisy zones.



7.5 Defrost and snow-free operation

***Note**: function available only in Master mode.*

7.5.1 Applications

To defrost the unit for heat pump applications or remove snow if the fans are installed outdoors.

7.5.2 Operation

It applies a constant voltage to the motor that keeps the fan blades rotating at constant speed. The circulating current heats the motor. The amount of voltage is set using the parameter **HP**.

With **HP** = 0, no voltage is dispensed.

With **HP** greater than 0, the voltage distribution to the motor can be activated with the start/stop contact, based on the settings of switch 4 of DIP switch SW1. See "DIP switch SW1" on page 13.

Function will automatically activate in the case of a closed contact, provided there is no regulation at device output.

***Note**: if **HP** = 0 (default) the START/STOP contact is used for the remote start/stop command of the control.*