

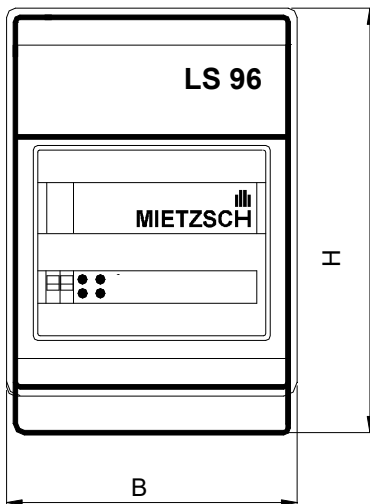
Fan control LS 96

Mounting, installation and operation

The Fan control LS 96 offered by our company is a compact solution for controlling fans with three-phase motors. The elegant control cabinet of plastic material contains all switching and operating elements, operational signal lamps and a complete motor protection with trouble signalling. This requires the fan to be ordered as special design TS (with thermal winding protection). Depending on the design version, up to three fans can be connected and separately activated.

Installation is very simple, only the mains connection and the connection to the fan need to be realised for commissioning.

The **LSU 96** version also includes a quartz-controlled timer with a daily and weekly programme. This means that activation can be controlled as a function of time.



Design versions

	for 1 fan	for 2 fans	for 3 fans
basic variant	LS 96 / 1 / 16 A	LS 96 / 2 / 16 A	LS 96 / 3 / 16 A
with timer	LSU 96 / 1 / 16 A	LSU 96 / 2 / 16 A	LSU 96 / 3 / 16 A
B x H x T	295 x 458 x 129 mm	403 x 458 x 129 mm	403 x 603 x 129 mm
weight	4 kg	5,5 kg	8 kg

In addition, the LS 96 and corresponding external supplementary devices permit various basic control and regulation tasks to be solved very easily:

- ◆ Control via external switch (make contact)
- ◆ Activation of flaps with OPEN/CLOSE setting drives 230V
- ◆ Activation of an air flow controller with trouble signalling
- ◆ Time control
- ◆ Temperature control/regulation
- ◆ Humidity control/regulation
- ◆ Connection for external operational signal lamps and trouble signalling

Combinations of different functions are possible.

Technical data

nominal voltage	3 x 400 V, 50 Hz (230V for single-phase motors)
nominal current	16 A (higher currents on request)
motor protection	thermal winding protection (PTC resistor)
housing	plastic material, IP 54
	dimensions see table
	with snap lock
cable inlet	top/bottom
weight	see table

Supplementary devices (special accessories)

Vapour-proof temperature controller FTR (-15 ... +30 °C)
 Humidity controller (hygrostat)
 Difference pressure controller for 1,000 Pa maximum
 Air flow controller LSU
 Alarm devices / Trouble signal lamps

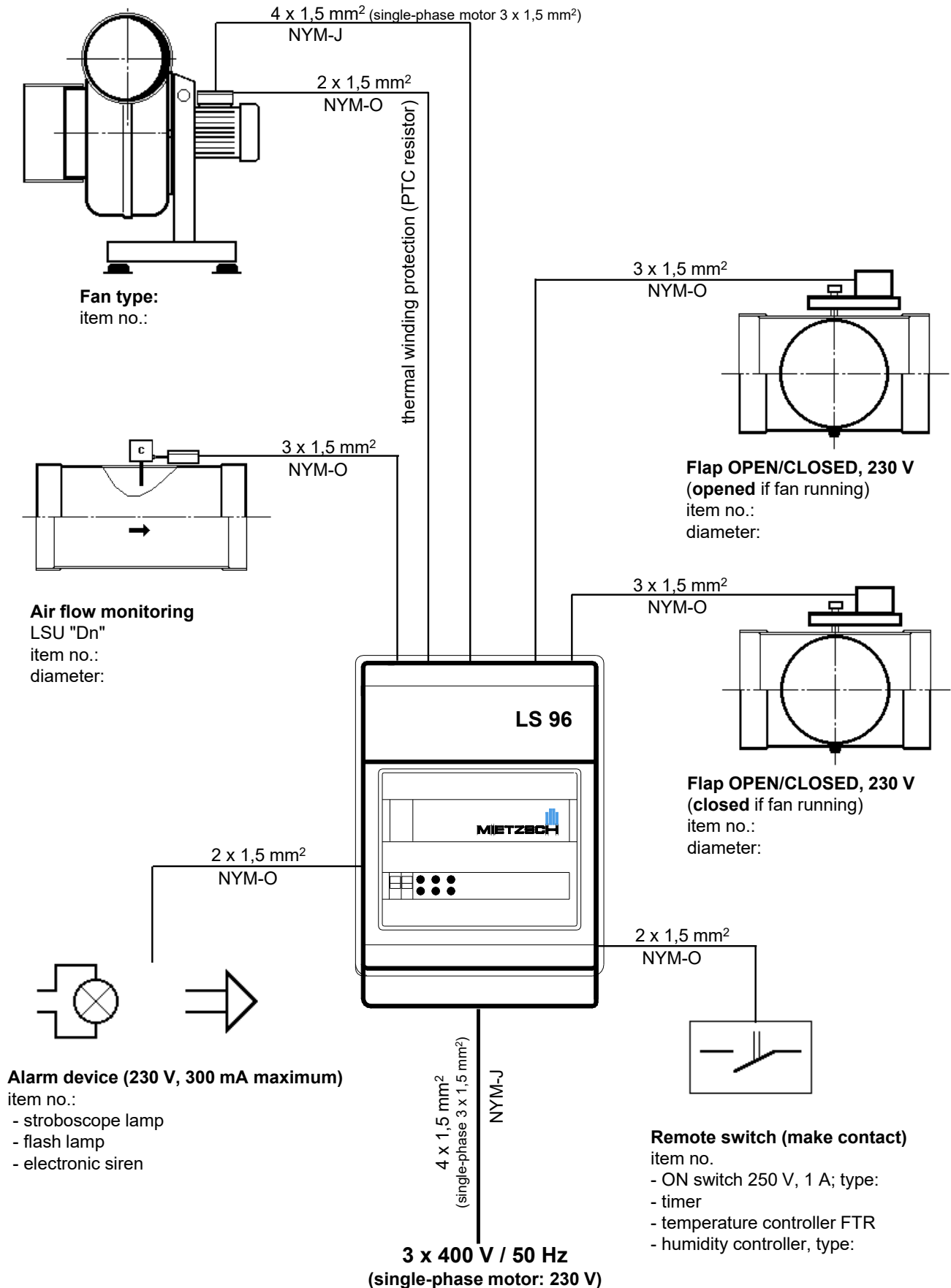
Special design versions

Control via external key(s) (special version 1 T or 2 T)
 Remote control of flaps with modulating actuators
 Other special versions on request

The fan control has modular layout. In cases of several fans the modules are identical and functioning independently of one another. Coupling is possible, e.g. by the connections for remote control switches.

Connection facilities specified in the operating instructions apply to all terminal strips X 1, X 2, X 3.

It is also possible to operate up to six fans in **group regime** from one module with consideration of maximum amperage (16 A). The positive temperature coefficient resistors of the single motor have then to be arranged in series.

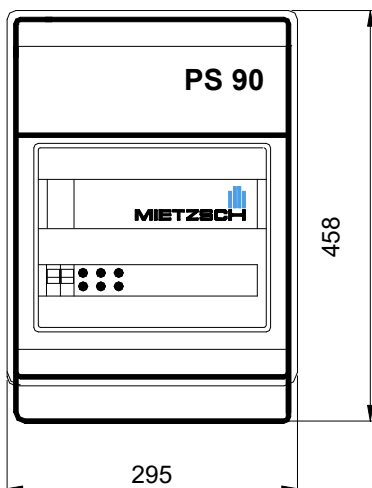


The cable type NYM specified above should be regarded as a proposal only. The devices have to be connected according to the relevant connection schemes enclosed to the devices (in particular instruction manual for LS 96).

With the PS 90 pole-changing switch, we offer a compact solution for switching the speed of fans with pole-changing motors. The attractively designed plastic control cabinet contains all switching and operating elements, operating indicator lights and a full motor protection device with fault signalling. The fan must therefore be ordered in the special TS version (with thermal winding protection - PTC thermistor). Installation is very simple, only the mains connection and the connection to the fan need to be realised for commissioning.

The **PSU 90** version also includes a quartz-controlled timer with daily and weekly programme and automatic summer/winter time changeover.

The operating states: off,
 lower speed,
 upper speed
 can thus be switched depending on the time.



Design versions

	Dahlander-winding (P1)	2 separate windings (P2)
basic variant	PS 90 / 1 / 16 A	PS 90 / 2 / 16 A
with timer	PSU 90 / 1 / 16 A	PSU 90 / 2 / 16 A

In addition, the PS 90 and corresponding external supplementary devices permit several simple control and regulation problems to be solved in a very easy way:

- ◆ Control via external switch (changeover switch)
- ◆ Activation of flaps with OPEN/CLOSE actuators 230V
- ◆ Connection of an air flow controller with trouble signalling
- ◆ Time control
- ◆ Temperature control and regulation
- ◆ Humidity control and regulation
- ◆ Connection for operation signal lamps and trouble signalling

Several function can be combined.

Technical data

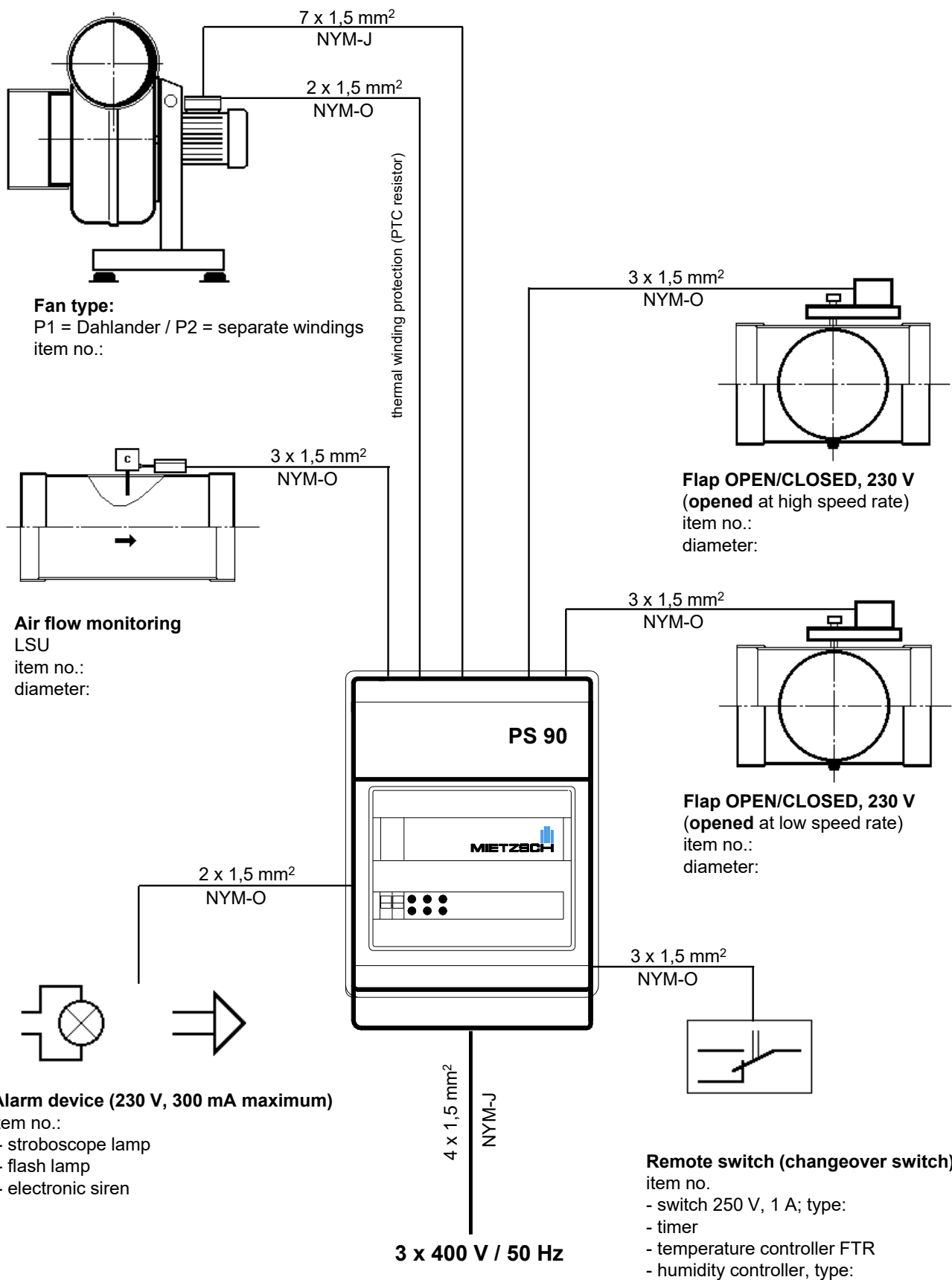
nominal voltage	3 x 400 V, 50 Hz
nominal current	16 A (higher currents on request)
motor protection	thermal winding protection (PTC resistor)
housing	plastic material, IP 54
	295 mm x 458 mm x 129 mm
	with snap lock
cable inlet	top/bottom
weight	4 kg

Supplementary devices (special accessories)

- Vapour-proof temperature controller FTR (-15 ... +30 °C)
- Humidity controller (hygrostat)
- Difference pressure controller for 1,000 Pa maximum
- Air flow controller LSU
- Alarm devices / Trouble signal lamps

Special design versions

- Control via external key(s) (special version 1 T or 2 T)
- Remote control of flaps with modulating actuators
- Other special versions on request



The cable type NYM specified above should be regarded as a proposal only. The devices have to be connected according to the relevant connection schemes enclosed to the devices (in particular instruction manual for PS 90).

The PS 90 is used to control fans with pole-changing motors. Depending on the position of the operating mode switch, the speed is switched on the PS 90 (MANUAL operating mode) or via external switching contacts (AUTO operating mode). The contacts must be potential-free and capable of withstanding a load of 250 V / 1 A.

In the standard version of the PS 90, an external changeover switch (changeover switch) is required, as is available with many controllers for pressure, temperature and humidity as well as time switches. Several switches and devices can be connected in parallel or in series. This results in a wide range of applications.

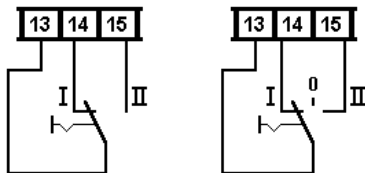
In particular for connection to fume cupboards, whose associated control system does not always provide a changeover contact for fan control, there are some **PS 90 - special versions** which are described below.

Additional functions such as damper control, air flow monitoring connection etc. are retained. All versions are available as PS 90/1 and PS 90/2.

In order to avoid faults and damage due to incorrect connection, the "interfaces" must be carefully coordinated at the planning stage. The type of switching contacts to be connected **directly** to the PS 90 is decisive.

We strongly advise against making the necessary adjustments on site by interfering with the PS 90.

Control via changeover switch (PS 90/1 and PS 90/2)

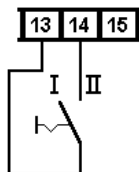


In the standard version, the fan control provides a changeover contact or a changeover contact with 0 position on the output side.

Function:

- no connection --> fan off
 - Connection 13 and 14 --> lower speed
 - Connection 13 and 15 --> upper speed
- Terminals 13, 14 and 15 must not be connected at the same time!

Control via normally open contact (PS 90/1 - 06 and PS 90/2 - 06)

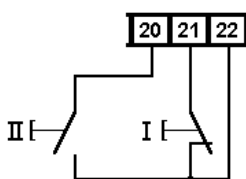


The fan control provides a normally open contact on the output side.

Function:

- no connection --> lower speed
 - Connection 13 and 14 --> upper speed
- Only damper actuators with 1-wire control can be connected.

Control via 2 push-buttons (PS 90/1 - 2T and PS 90/2 - 2T)

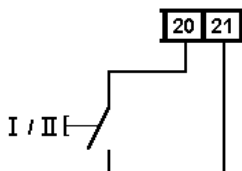


The fan control provides **two push-buttons** that are connected directly to the PS 90 -2T.

Function:

- Press normally closed contact I --> lower speed
- Press normally open contact II --> upper speed

Control via 1 push-button (PS 90/1 - 1T and PS 90/2 - 1T)



The fan control provides **one push-button** (normally open contact) which is connected directly to the PS 90 -1T.

Function:

- press repeatedly --> change between upper and lower speed

Remarks