Temperature Control

Microprocessor temperature control units for cast resin, air and oil transformers

**MT 200 (PAG 4)**
4-input device for 3-wire PT100 probes

**ME 100 (PAG 6)**
8-input device for 3-wire PT100 probes

- MT 200
- MT 200 50121-5 RAILWAY
- MT 200 S MODBUS-RTU
- MT 200 C MODBUS-RTU - 4-20 mA
- MT 200 E ETHERNET MODBUS-TCP

**MT 300 (PAG 8)**
2-input device for PTC probes

- ME 100 ASCII
- ME 100 V2 4-20 mA
- ME 100 V3 MODBUS-RTU
- ME 100 E ETHERNET MODBUS-TCP

Fan systems

**AT 200 (PAG 9)**
Electronic device for the protection and control of motors in fan systems

**FANBOX (PAG 20)**
Junction box for a pair of fan systems

<table>
<thead>
<tr>
<th>Power transformer (suggested)</th>
<th>Max flow rate 50 Hz</th>
<th>Max flow rate 60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAN 400 (PAG 9) 100 - 315 KVA</td>
<td>870 m³/h</td>
<td>570 m³/h</td>
</tr>
<tr>
<td>FAN 900 (PAG 11) 400 - 1250 KVA</td>
<td>960 m³/h</td>
<td>690 m³/h</td>
</tr>
<tr>
<td>FAN 1200 (PAG 13) 1250 - 1600 KVA</td>
<td>1245 m³/h</td>
<td>1125 m³/h</td>
</tr>
<tr>
<td>FAN 1800 (PAG 15) 1600 - 2000 KVA</td>
<td>2640 m³/h</td>
<td>2850 m³/h</td>
</tr>
<tr>
<td>FAN 3300 (PAG 17) 2500 KVA</td>
<td>3660 m³/h</td>
<td>3660 m³/h</td>
</tr>
</tbody>
</table>
Temperature probes and accessories

**PT100 (PAG 24)**
100 Ohm platinum temperature probes for electric machines, cable and terminal in silicone or PTFE, dielectric strength 2.5 or 30 kV 60 sec.

**PT1000 (PAG 25)**
1000 Ohm platinum temperature probes, cable and terminal in silicone, dielectric strength 2.5 kV 60 sec.

**PTC-NTC (PAG 25)**
Thermistor PTC-NTC cable and terminal in silicone, dielectric strength 2.5 kV 60 sec.

**THERMOCOUPLES (PAG 28)**
Thermocouples for temperature control type K - J - T, ANSI/MC96.1 standards, cable and terminal in silicone or PTFE, with protected or exposed joint, dielectric strength 2.5 kV 60 sec.

**PTCK (PAG 27)**
Standard temperature sensors with fixed threshold PTCK.

**PT100 DIN-B (PAG 29)**
Temperature sensors housed in a steel shaft for oil transformers

**P-BOX (PAG 30)**
Junction box in die-cast aluminum for probes

**P-BOX T (PAG 31)**
Junction box in thermoplastic material for probes

All temperature probes are configurable on demand
Microprocessor temperature monitor system for resin, dry and oil transformers with 4 inputs for 3 wires PT100 probes.

- Control and showing temperature
- Control of fan systems
- Four independent PT100 inputs with three wires
- Four 250 Volt 10A AC (resistive load) relays of outputs for the following functions: pre alarm state, alarm state, fault probe state, fan control with hysteresis
- Manual test relays to simulate or check the reliability of the contact
- Advanced programming menu: is allowed able, enable and set separately each single channel
- Permanent storing of programmed set of pre-alarm and alarm state, on, off fan and history values achieved
- Assembly on panel by simple fixing jaws
- Universal power supply (24 ÷ 240) Volt AC/DC 50/60Hz
- Protocol MODBUS - RTU, RS 485 communication (MT 200 S)
- Protocol MODBUS - RTU, RS 485 communication and galvanically insulated analogical output 4-20mA (MT 200 C)
- Protocol MODBUS - TCP, ETHERNET communication (MT 200 E)
- Tropicalization (optional)

Models

**MT 200**
Temperature controller device, 4 inputs PT100 probes, 4 relays
COD.: MT200LITE

**MT 200 50121-5**
Temperature controller device, 4 inputs PT100 probes, 4 relays according to EN 50121-5 rule
COD.: MT200L 50121-5

**MT 200 S**
Temperature controller device, 4 inputs PT100 probes, 4 relays, serial communication RS485 half duplex, MODBUS-RTU protocol
COD.: MT200LITE S

**MT 200 C**
Temperature controller device, 4 inputs PT100 probes, 4 relays, analogical communication 0-20 or 4-20 mA and serial communication RS485 half duplex, MODBUS-RTU protocol
COD.: MT200LITE C

**MT 200 E**
Temperature controller device, 4 inputs PT100 probes, 4 relays, ETHERNET communication, MODBUS-TCP protocol.
COD.: MT200LITE E
Technical features

Dimensions
- Box 90x90x115 mm included terminal blocks
- Front panel 96x96 mm
- Weight 0.4 Kg

Power Supply
- Power supply (24 ÷ 240) Volt AC/DC ± 10% 50/60 Hz without polarity respect, absorption 4 VA

Inputs
- Four analogical inputs, temperature control and mapping with PT100 sensor at three wires inside range from -10°C to +200°C

Outputs
- Four relays 250V AC, 10 A max (resistive load), free switch contact
- RS485 Half Duplex protocol MODBUS-RTU (MT 200 S)
- RS485 Half Duplex protocol MODBUS-RTU, 4-20 mA or 0-20 mA galvanically isolated (MT 200 C)
- ETHERNET communication port, protocol MODBUS - TCP (MT 200 E)

Characteristics
- Self-extinguishable NORYL Box
- Protection degree front panel in polycarbonate: IP65 (IP66 on request)
- Protection degree of rear panel on terminal board side: IP20
- Display with light segments
- Visualisation of max temperature and the relevant channel in the automatic mode
- Alerts of pre-alarm, alarm, probes fault, fanning, manual function, historic highs
- System programming directly by frontal panel
- Possibility to select independently each channel
- Limit of alarm and pre-alarm settable in the range (-9°C ÷ 199°C)
- Precision ± 1% on full-scale ± 1 digit
- Cooling fan control on three or four channels
- Comparison of temperature for cooling fan between two different levels (L and H)
- Four selectable operating modes
- Detection of fault probes, maximum flexibility of managing and simplicity of programming, checking of validity of the insert data during programming phase
- Continuous storage of planned and reached values by each channel (limits and historic highs)
- Dielectric isolation: 2,5 KV AC for 60°
- Software configuration to control the environment temperature
- Resolution 1°C
- Working temperature of device from -20°C to 60°C
- Max allowed dampness in the room 90% not condensing
- Electrical connections with fast-polarised connectors
- Possibility of manual relays switch through menu test relays to simulate and check the reliability of contact
- Galvanically insulated output 4-20 mA or 0-20 mA (MT200 C)
- Maximum impedance allowed for current output 500 Ohm
  - Range 4-20 mA (-10°C 4 mA / +200°C 20 mA)
  - Transformation formula (current in mA, temperature in °C): \( \text{lout} = \frac{\text{T}+10}{210}*16 + 4 \)
  - Range 0-20 mA (-10°C 0 mA / +200°C 20 mA)
  - Transformation formula (current in mA, temper ature in °C): \( \text{lout} = \frac{\text{T}+10}{210}*20 \) (MT200 C)
- Certification for railway environment use according to EN-50121-5:2006 regulations (MT 200 EN50121-5)
- Configuration of IP address, port, su bnet, gateway via browser web (MT200 E)
- Technical manual in five languages (and more on request)
- Construction in accordance with rules CE
- Input filter for power supply in accordance with rules CE
- Tropicalization (optional)
Microprocessor temperature monitor system for resin, dry and oil transformers with 8 inputs for 3 wires PT100 probes.

- Control and showing temperature
- Control of fan systems
- Eight independent PT100 inputs with three wires
- Four 250 Volt 10 A AC (resistive load) relays of outputs for the following functions: pre alarm state, alarm state, fault probe state, fan control with hysteresis (ME100 – ME100 V3)
- Five 250 Volt 10 A AC (resistive load) relays of outputs for the following functions: pre alarm state, alarm state, fault probe state, separate fan control with hysteresis (ME100 V2)
- Manual test relays to simulate or check the reliability of the contact
- Advanced programming menu: is allowed able, enable and set separately each single channel
- Permanent storing of programmed set of pre-alarm and alarm state, on, off fan and history values achieved
- Assembly on panel by simple fixing jaws
- Universal power supply (24 ÷ 240) Volt AC/DC 50/60Hz
- Serial communication port RS485 full duplex, own ASCII communication protocol (ME100)
- Galvanically insulated analogical output 4-20 mA (ME100 V2)
- Protocol MODBUS - RTU, RS 485 communication (ME100 V3)
- Protocol MODBUS - TCP, ETHERNET communication (ME 100 E)
- Tropicalization (optional)

**Models**

**ME 100**
Temperature controller device, 8 inputs PT100 probes, 4 relays and serial communication port RS485 full duplex, own ASCII communication protocol
COD.: ME100

**ME 100 V2**
Temperature controller device, 8 inputs PT100 probes, 5 relays with analogical output 4–20mA referred to the channel with the most high temperature
COD.: ME100 V2

**ME 100 V3**
Temperature controller device, 8 inputs PT100 probes, 4 relays with MODUSBUS – RTU protocol
COD.: ME100 V3

**ME 100 E**
Temperature controller device, 8 inputs PT100 probes, 4 relays, ETHERNET communication, MODBUS-TCP protocol.
COD.: ME100 E
Technical features

Dimensions
- Box 90x90x130 mm included terminal blocks
- Front panel 96x96 mm
- Weight 0.6 Kg

Power Supply
- Power supply (24 ÷ 240) Volt AC/DC ± 10% 50/60Hz without polarity respect, absorption 4 VA

Inputs
- Eight analogical inputs, temperature control and mapping with PT100 sensor at three wires inside range from -10°C to +200°C

Outputs
- Four relays 250V AC, 10 A max (resistive load), free switch contact (ME100 - ME100 V3 - ME100 E)
- Five relays 250V AC, 10 A max (resistive load), free switch contact (ME 100 V2)
- Serial communication port RS485 full duplex, own ASCII communication protocol (ME100)
- Galvanically insulated analogical output 4-20 mA referred to the channel with the most high temperature (ME100 V2)
- Serial communication port RS485 full duplex protocol of MODBUS - RTU (ME 100 V3)
- ETHERNET communication port, protocol MODBUS - TCP (ME100 E)

Characteristics
- Self-extinguishable NORYL Box
- Protection degree front panel in polycarbonate: IP65 (IP66 on request)
- Protection degree of rear panel on terminal board side: IP20
- Display with light segments
- Visualisation of max temperature and the relevant channel in the automatic mode
- Alerts of pre-alarm, alarm, probes fault, fanning, manual function, historic highs
- System programming directly by frontal panel
- Possibility to select independently each channel
- Limit of alarm and pre-alarm settable in the range (-9°C ÷ 199°C)
- Precision ± 1% on full-scale ± 1 digit
- Cooling fan control on three or four channels
- Comparison of temperature for cooling fan between two different levels (L and H).
- Four selectable operating modes
- Detection of fault probes, maximum flexibility of managing and simplicity of programming, checking of validity of the insert data during programming phase
- Continuous storage of planned and reached values by each channel (limits and historic highs)
- Dielectric isolation: 2.5 KV AC for 60"
- Software configuration to control the environment temperature
- Resolution 1°C
- Working temperature of device from -20°C to 60°C
- Max allowed dampness in the room 90% not condensing
- Electrical connections with fast-polarised connectors
- Possibility of manual relays switch through menu test relays to simulate and check the reliability of contact
- Configuration of IP address, port, subnet, gateway via browser web (ME100 E)
- Technical manual in three languages (and more on request)
- Construction in accordance with rules
- Input filter for power supply in accordance with rules
- Tropicalization (optional)
Microprocessor temperature monitor system for electrical transformers with 2 inputs for PTC probes

- Two PTC inputs with fixed temperature level (see PTCK series sensors)
- Possibility to connect up to six PTCK sensors in line for each channel (max. 1.5 Kohm for channel)
- Interconnections among the relays contacts are shown in schema
- Visualization correct working state
- Visualization pre-alarm and alarm state
- Intrinsic sure protection system with relays always on and signalling with switch off relays
- Delay at power on (1 sec. about) for a direct connection with a shut down device
- Assembly on rear panel by quick coupling with Din rail
- Power supply (220 ± 240) Volt AC 50/60Hz
- Tropicalization (optional)

COD.: MT300 DIN

Technical features

**Dimensions**
- Standard box suitable for DIN rail 90x52x57 mm
- Front panel 49x42 mm
- Weight 0.2 Kg

**Power Supply**
- Power supply (220 ± 240) Volt AC ± 10% 50/60Hz, absorption 2VA

**Inputs**
- Two distinguished input channels for PTC sensors with possibility to connect max six sensors in serial connections on every branch (max 1.5 Kohm per branch)

**Outputs**
- Output by relays with free contacts connected as per schema at the end of the manual.

**Characteristics**
- Self-extinguishable NORYL Box
- Protection degree front panel in polycarbonate: IP30
- Protection degree on terminal board side: IP20
- Two 250V AC 5A maximum relays contact (resistive load)
- Dielectric strength between relays contacts and alimentation line 2,5KV AC for 60°
- Working temperature of device from -20°C to 60°C
- Max allowed dampness in the room 90% not condensing
- Electrical connections with fast-polarised connectors
- Technical manual in five languages (and more on request)
- Construction in accordance with rules
- Tropicalization (optional)
AT 200

Protection and motor driver for fan cooling systems

- Projected to consent the protection of low power electric motors
- Management of the forced ventilation in the electric power transformers
- Electronic system of reading of the nominal current absorbed from the engines
- Driving and protection of two independent groups of motors which could be commanded in manual or in automatic mode with a remote input command
- Each branch is able to command loads with current up to 5A
- Initial self-calibration
- Rapid action when check an anomalous absorption of current
- The alarm will be generated in the following situations:
  1. excessive absorption of current, (one or more motors could be overloaded from anomalous mechanics causes (for example block of the impeller in the fans system))
  2. missing absorption of current, (one or more fan motors don’t have power supply for any motive, the ventilation of the electric machine could result insufficient)

Technical features

COD.: AT200

Dimensions
- Box 90x90x130 mm included terminal blocks
- Front panel 96x96 mm
- Weight 0.5 Kg

Power Supply
- Power supply (220-240) Volt AC ± 10% 50/60Hz

Inputs
- Two PTC probes
- Remote control

Outputs
- Fault relay 250V AC, 5A maximum resistive, one switch contact
- Fan motor 1, max 5A 220-240V AC 50-60Hz ±10%
- Fan motor 2 max 5A 220-240V AC 50-60Hz ±10%

Characteristics
- Self-extinguishable NORYL Box
- Protection degree front panel in polycarbonate: IP65
- Protection degree of rear panel on terminal board side: IP20
- Display with light segments
- Measurement and control of current absorbed by fan motors on two independent lines
- Auto-calibration of rated current absorbed by each ventilation line
- Generation of warning signals in case of current consumption greater or lower than the nominal current measured upon auto-calibration, over temperature of at least one fan motor
- Operating mode (via remote control of ventilation system): automatic, manual or channel scan
- Maximum management flexibility and ease of programming
- Continuous storage of planned and reached values
- Working temperature of device from -20°C to 60°C
- Max allowed dampness in the room 90% not condensing
- Electrical connections with fast polarised connectors
- Technical manual in two languages (and more on request)
- Construction in accordance with rules
- Input filter for power supply in accordance with rules
- Tropicalization (optional)
**FAN 400**

Fan cooling systems for transformers from 100 to 315 KVA

- Ventilation management of three-phase dry transformers
- Easily installation thanks to comfortable junction or fixed brackets
- Possibility to easily position and adjust the bar, thanks to a sliding system of the ventilating body with respect to the fixed bar
- Motors with shafts supported by self-lubricating bearings to guarantee a long continuous life
- The ventilation bars are supplied already assembled and equipped with or without terminal socket IP44 or protection device FANBOX

**Models**

**FAN0400**
Fan system for transformers from 100 to 315 KVA with junction bracket and terminal board IP44
COD.: FAN0400

**FAN0400FB**
Fan system for transformers from 100 to 315 KVA with junction bracket and protection device FANBOX
COD.: FAN0400FB

**FAN0400A**
Fan system for transformers from 100 to 315 KVA with fixed bracket and terminal board IP44
COD.: FAN0400A

**FAN0400FBA**
Fan system for transformers from 100 to 315 KVA with fixed bracket and protection device FANBOX
COD.: FAN0400FBA

**Technical features**

**Dimensions**
- Fan bar length 1050 ÷ 1270 mm
- Single fan length 350 mm
- Complete fan bar weight 10 Kg

**Alimentation**
- Alimentation 220 ÷ 230V AC 50/60 Hz
- Terminal socket IP44 - FANBOX (optional)

**Fixing**
- Adjustable junction or fixed brackets

**Characteristics**
- Suitable to transformers with powers from 100 a 315 KVA
- Insulated engine in H class
- Long-lasting engine with protection against dust and humidity
- Aluminium fan ø 60x240 mm
- Crankshaft in hardened and ground steel
- Body and protection grid in galvanized sheet
- Max power absorbed: 3x52W (50Hz) 3x46W (60Hz)
- Max flowrate: 3x290 m³/h (50Hz) 3x190 m³/h (60Hz)
- Working temperature: -10°C ÷ +60°C
- Engine revving: 2180 rpm (50Hz) 1450 rpm (60Hz)
- Noisiness: 65 dBa (50Hz) 52 dBa (60Hz)
- Single fan number: 3
- Construction in accordance with rules
Dimensions

Fan bar kit

Fan bar is sold assembled and made of:

- Support brackets
- Three fans
- Two adjustable junctions brackets or two adjustable fixed brackets as per version ordered
- Screws and bolts
- Terminal socket IP44 or FANBOX protection device as per version ordered
**FAN 900**

Fan cooling systems for transformers from 400 to 1250 KVA

- Ventilation management of three-phase dry transformers
- Easily installation thanks to comfortable junction or fixed brackets
- Possibility to easily position and adjust the bar, thanks to a sliding system of the ventilating body with respect to the fixed bar
- Motors with shafts supported by self-lubricating bearings to guarantee a long continuous life
- The ventilation bars are supplied already assembled and equipped with or without terminal socket IP44 or protection device FANBOX

**Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAN0900</td>
<td>Fan system for transformers from 400 to 1250 KVA with junction bracket and terminal board IP44</td>
<td>FAN0900</td>
</tr>
<tr>
<td>FAN0900FB</td>
<td>Fan system for transformers from 400 to 1250 KVA with junction bracket and protection device FANBOX</td>
<td>FAN0900FB</td>
</tr>
<tr>
<td>FAN0900A</td>
<td>Fan system for transformers from 400 to 1250 KVA with fixed bracket and terminal board IP44</td>
<td>FAN0900A</td>
</tr>
<tr>
<td>FAN0900FBA</td>
<td>Fan system for transformers from 400 to 1250 KVA with fixed bracket and protection device FANBOX</td>
<td>FAN0900FBA</td>
</tr>
</tbody>
</table>

**Technical features**

**Dimensions**
- Fan bar length 1410 ÷ 1745 mm
- Single fan length 470 mm
- Complete fan bar weight 12 Kg

**Alimentation**
- Alimentation 220 ÷ 230V AC 50/60Hz
- Terminal socket IP44 - FANBOX (optional)

**Fixing**
- Adjustable junction or fixed brackets

**Characteristics**
- Suitable to transformers with powers from 400 to 1250 KVA
- Insulated engine in H class
- Long-lasting engine with protection against dust and humidity
- Aluminium fan ø 60x360 mm
- Crankshaft in hardened and ground steel
- Body and protection grid in galvanized sheet
- Max power absorbed: 3x54W (50Hz) 3x46W (60Hz)
- Max flowrate: 3x320 m³/h (50Hz) 3x230 m³/h (60Hz)
- Working temperature: -10°C ÷ +60°C
- Engine revving: 1560 rpm (50Hz) 1160 rpm (60Hz)
- Noiseness: 57 dBA (50Hz) 66 dBA (60Hz)
- Single fan number: 3
- Construction in accordance with rules CEE
Dimensions

Fan bar kit

Fixing

Fan bar is sold assembled and made of:

- Support brackets
- Three fans
- Two adjustable junctions brackets or two adjustable fixed brackets as per version ordered
- Screws and bolts
- Terminal socket IP44 or FANBOX protection device as per version ordered
Fan cooling systems for transformers from 1250 to 1600 KVA

- Ventilation management of three-phase dry transformers
- Easily installation thanks to comfortable junction or fixed brackets
- Possibility to easily position and adjust the bar, thanks to a sliding system of the ventilating body with respect to the fixed bar
- Motors with shafts supported by self-lubricating bearings to guarantee a long continuous life
- The ventilation bars are supplied already assembled and equipped with or without terminal socket IP44 or protection device FANBOX

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>COD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAN1200</td>
<td>Fan system for transformers from 1250 to 1600 KVA with junction bracket and terminal board IP44</td>
<td>FAN1200</td>
</tr>
<tr>
<td>FAN1200FB</td>
<td>Fan system for transformers from 1250 to 1600 KVA with junction bracket and protection device FANBOX</td>
<td>FAN1200FB</td>
</tr>
<tr>
<td>FAN1200A</td>
<td>Fan system for transformers from 1250 to 1600 KVA with fixed bracket and terminal board IP44</td>
<td>FAN1200A</td>
</tr>
<tr>
<td>FAN1200FBA</td>
<td>Fan system for transformers from 1250 to 1600 KVA with fixed bracket and protection device FANBOX</td>
<td>FAN1200FBA</td>
</tr>
</tbody>
</table>

Technical features

**Dimensions**
- Fan bar length 1550 ÷ 1880 mm
- Single fan length 495 mm
- Complete fan bar weight 17 Kg

**Alimentation**
- Alimentation 220 ÷ 230V AC 50/60Hz
- Terminal socket IP44 - FANBOX (optional)

**Fixing**
- Adjustable junction or fixed brackets

**Characteristics**
- Suitable to transformers with powers from 1250 to 1600 KVA
- Insulated engine in H class
- Long-lasting engine with protection against dust and humidity
- Aluminium fan ø 80x360 mm
- Crankshaft in hardened and ground steel
- Body and protection grid in galvanized sheet
- Max power absorbed: 3x44W (50Hz) 3x47W (60Hz)
- Max flowrate: 3x415 m³/h (50Hz) 3x375 m³/h (60Hz)
- Working temperature: -10°C ÷ +60°C
- Engine revving: 1160 rpm (50Hz) 1050 rpm (60Hz)
- Noiseness: 59 dBA (50Hz) 59 dBA (60Hz)
- Single fan number: 3
- Construction in accordance with rules CE
Dimensions

1550-1880 mm
525-690 mm
450-1350 mm
495 mm
350 mm
132 mm

Fixing

Junction brackets

Fixed brackets

Fan bar kit

Fan bar is sold assembled and made of:

- Support brackets
- Three fans
- Two adjustable junctions brackets or two adjustable fixed brackets as per version ordered
- Screws and bolts
- Terminal socket IP44 or FANBOX protection device as per version ordered
Fan cooling systems for transformers from 1600 to 2000 KVA

- Ventilation management of three-phase dry transformers
- Easily installation thanks to comfortable junction or fixed brackets
- Possibility to easily position and adjust the bar, thanks to a sliding system of the ventilating body with respect to the fixed bar
- Motors with shafts supported by self-lubricating bearings to guarantee a long continuous life
- The ventilation bars are supplied already assembled and equipped with or without terminal socket IP44 or protection device FANBOX

**Models**

**FAN1800**
Fan system for transformers from 1600 to 2000 KVA with junction bracket and terminal board IP44
COD.: FAN1800

**FAN1800FB**
Fan system for transformers from 1600 to 2000 KVA with junction bracket and protection device FANBOX
COD.: FAN1800FB

**FAN1800A**
Fan system for transformers from 1600 to 2000 KVA with fixed bracket and terminal board IP44
COD.: FAN1800A

**FAN1800FBA**
Fan system for transformers from 1600 to 2000 KVA with fixed bracket and protection device FANBOX
COD.: FAN1800FBA

**Technical features**

**Dimensions**
- Fan bar length 1550 ÷ 1880 mm
- Single fan length 495 mm
- Complete fan bar weight 18 Kg

**Alimentation**
- Alimentation 220 ÷ 230V AC 50/60Hz
- Terminal socket IP44 - FANBOX (optional)

**Fixing**
- Adjustable junction or fixed brackets

**Characteristics**
- Suitable to transformers with powers from 1600 to 2000 KVA
- Insulated engine in H class
- Long-lasting engine with protection against dust and humidity
- Aluminium fan ø 80x360 mm
- Crankshaft in hardened and ground steel
- Body and protection grid in galvanized sheet
- Max power absorbed: 3x120 W (50Hz) 3x160 W (60Hz)
- Max flowrate: 3x880 m³/h (50Hz) 3x950 m³/h (60Hz)
- Working temperature: -10°C ÷ +60°C
- Engine revving: 2600 rpm (50Hz) 2900 rpm (60Hz)
- Noiseness: 69 dBA (50Hz) 74 dBA (60Hz)
- Single fan number: 3
- Construction in accordance with rules CE
**Dimensions**

![Dimensions Diagram]

**Fixing**

**Junction brackets**

**Fixed brackets**

![Junction brackets Diagram]

![Fixed brackets Diagram]

**Fan bar kit**

Fan bar is sold assembled and made of:

- Support brackets
- Three fans
- Two adjustable junctions brackets or two adjustable fixed brackets as per version ordered
- Screws and bolts
- Terminal socket IP44 or FANBOX protection device as per version ordered
FAN 3300

Fan cooling systems for transformers from 2500 KVA

- Ventilation management of three-phase dry transformers
- Easily installation thanks to comfortable junction or fixed brackets
- Possibility to easily position and adjust the bar, thanks to a sliding system of the ventilating body with respect to the fixed bar
- Motors with shafts supported by self-lubricating bearings to guarantee a long continuous life
- The ventilation bars are supplied already assembled and equipped with or without terminal socket IP44 or protection device FANBOX

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>FAN3300</td>
<td>Fan system for transformers from 2500 KVA with junction bracket and terminal board IP44</td>
<td>FAN3300</td>
</tr>
<tr>
<td>FAN3300FB</td>
<td>Fan system for transformers from 2500 KVA with junction bracket and protection device FANBOX</td>
<td>FAN3300FB</td>
</tr>
<tr>
<td>FAN3300A</td>
<td>Fan system for transformers from 2500 KVA with fixed bracket and terminal board IP44</td>
<td>FAN3300A</td>
</tr>
<tr>
<td>FAN3300FBA</td>
<td>Fan system for transformers from 2500 KVA with fixed bracket and protection device FANBOX</td>
<td>FAN3300FBA</td>
</tr>
</tbody>
</table>

Technical features

**Dimensions**
- Fan bar length 1975 ÷ 2390 mm
- Single fan length 640 mm
- Complete fan bar weight 19 Kg

**Alimentation**
- Alimentation 220 ÷ 230V AC 50/60Hz
- Terminal socket IP44 - FANBOX (optional)

**Fixing**
- Adjustable junction or fixed brackets

**Characteristics**
- Suitable to transformers with powers from 2500 KVA
- Insulated engine in H class
- Long-lasting engine with protection against dust and humidity
- Aluminium fan ø 80x500 mm
- Crankshaft in hardened and ground steel
- Body and protection grid in galvanized sheet
- Max power absorbed: 3x180W (50Hz) 3x206W (60Hz)
- Max flowrate: 3x1220 m³/h (50Hz) 3x1220 m³/h (60Hz)
- Working temperature: -10°C + +60°C
- Engine revving: 2400 rpm (50Hz) 2400 rpm (60Hz)
- Noisiness: 70 dBa (50Hz) 74 dBa (60Hz)
- Single fan number: 3
- Construction in accordance with rules CE
Dimensions

Fan bar kit

Fan bar is sold assembled and made of:

- Support brackets
- Three fans
- Two adjustable junctions brackets or two adjustable fixed brackets as per version ordered
- Screws and bolts
- Terminal socket IP44 or FANBOX protection device as per version ordered
Junction box for the control of a couple of fans

With this easy and economic system is possible to control directly by the thermometric device or any relay with a clean contact, a pair of fans.

Each bar is fitted with:
- Two fuse protection (one for each fan bar)
- One power relay that controls the switch on and off of the fans

The device is mounted directly from the factory on one of the standard fans in any size. It’s enough to have a 230V AC power source and a run signal from the thermometric device to fully manage the ventilation of the transformer.

Construction in accordance with rules CE

COD.: FANBOX

Example of FANBOX assembling on fan bar
## INSTALLATION

**Fan bars suggested**

<table>
<thead>
<tr>
<th>Power Transformer (suggested)</th>
<th>Bracket support type</th>
<th>Base Version code</th>
<th>FANBOX Version code</th>
<th>Single code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FAN 400</strong></td>
<td>Junction brackets</td>
<td>FAN0400</td>
<td>FAN400FB</td>
<td>FAN400S</td>
</tr>
<tr>
<td></td>
<td>Fixed brackets</td>
<td>FAN0400A</td>
<td>FAN400FBA</td>
<td></td>
</tr>
<tr>
<td><strong>FAN 900</strong></td>
<td>Junction brackets</td>
<td>FAN0900</td>
<td>FAN900FB</td>
<td>FAN900S</td>
</tr>
<tr>
<td></td>
<td>Fixed brackets</td>
<td>FAN0900A</td>
<td>FAN900FBA</td>
<td></td>
</tr>
<tr>
<td><strong>FAN 1200</strong></td>
<td>Junction brackets</td>
<td>FAN1200</td>
<td>FAN1200FB</td>
<td>FAN1200S</td>
</tr>
<tr>
<td></td>
<td>Fixed brackets</td>
<td>FAN1200A</td>
<td>FAN1200FBA</td>
<td></td>
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<tr>
<td><strong>FAN 1800</strong></td>
<td>Junction brackets</td>
<td>FAN1800</td>
<td>FAN1800FB</td>
<td>FAN1800S</td>
</tr>
<tr>
<td></td>
<td>Fixed brackets</td>
<td>FAN1800A</td>
<td>FAN1800FBA</td>
<td></td>
</tr>
<tr>
<td><strong>FAN 3300</strong></td>
<td>Junction brackets</td>
<td>FAN3300</td>
<td>FAN3300FB</td>
<td>FAN3300S</td>
</tr>
<tr>
<td></td>
<td>Fixed brackets</td>
<td>FAN3300A</td>
<td>FAN3300FBA</td>
<td></td>
</tr>
</tbody>
</table>

### Mounting

**FAN 400 - 900**

- Junction brackets
- Fixed brackets

**FAN 1200 - 1800 - 3300**

- Junction brackets
- Fixed brackets
## Technical features

<table>
<thead>
<tr>
<th>SFAN 400 50 Hz</th>
<th>SFAN 400 60 Hz</th>
<th>SFAN 900 50 Hz</th>
<th>SFAN 900 60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impeller dimensions</strong></td>
<td>Ø 60x240 mm</td>
<td>Ø 60x360 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Fan dimensions</strong></td>
<td>350x120 mm</td>
<td>470x120 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Alimentation</strong></td>
<td>220 ÷ 230 Volt AC 50 Hz</td>
<td>220 ÷ 230 Volt AC 60 Hz</td>
<td>220 ÷ 230 Volt AC 50 Hz</td>
</tr>
<tr>
<td><strong>Max absorbed power</strong></td>
<td>52 W</td>
<td>46 W</td>
<td>54 W</td>
</tr>
<tr>
<td><strong>Max flow rate</strong></td>
<td>290 m³/h</td>
<td>190 m³/h</td>
<td>320 m³/h</td>
</tr>
</tbody>
</table>

**FAN SYSTEMS**
## Technical features

<table>
<thead>
<tr>
<th></th>
<th>SFAN 1200 50 Hz</th>
<th>SFAN 1200 60 Hz</th>
<th>SFAN 1800 50 Hz</th>
<th>SFAN 1800 60 Hz</th>
<th>SFAN 3300 50 Hz</th>
<th>SFAN 3300 60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impeller dimensions</strong></td>
<td>Ø 80x360 mm</td>
<td>Ø 80x510 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fan dimensions</strong></td>
<td>495x132 mm</td>
<td>640x132 mm</td>
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<td></td>
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<tr>
<td><strong>Alimentation</strong></td>
<td>220 + 230 Volt AC 50 Hz</td>
<td>220 + 230 Volt AC 60 Hz</td>
<td>220 + 230 Volt AC 50 Hz</td>
<td>220 + 230 Volt AC 60 Hz</td>
<td>220 + 230 Volt AC 50 Hz</td>
<td>220 + 230 Volt AC 60 Hz</td>
</tr>
<tr>
<td><strong>Max absorbed power</strong></td>
<td>44 W</td>
<td>47 W</td>
<td>120 W</td>
<td>160 W</td>
<td>180 W</td>
<td>206 W</td>
</tr>
<tr>
<td><strong>Max flow rate</strong></td>
<td>415 m³/h</td>
<td>375 m³/h</td>
<td>880 m³/h</td>
<td>950 m³/h</td>
<td>1220 m³/h</td>
<td>1220 m³/h</td>
</tr>
</tbody>
</table>
Platinum temperature probes with 100 ohm reference resistance with three or four wires

Particularly suitable probe where it is required a high standard of insulation and good precision in temperature measurement.

**PT100S**
- PT100 RTD sensor according to DIN 43760
- Cylindrical silicone cap diam. 6x30 mm
- Silicone cable with 3 or 4 CuSn conductors section 0.22 mm², silicone insulated, 2 red and 1 or 2 white, aluminium taped with metal guard wire
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 5.0 KV AC for 60"
- Maximum temperature 200°C
- Construction in accordance with rules €

**PT100TF**
- PT100 RTD sensor according to DIN 43760
- Cylindrical PTFE cap diam. 4.8x30 mm
- PTFE cable with 3 or 4 CuSn conductors section 0.22 mm², PTFE insulated, 2 red and 1 or 2 white, with shield wire
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60"
- Maximum temperature 220°C
- Construction in accordance with rules €

**PT100HV**
- PT100 RTD sensor according to DIN 43760
- Cylindrical PTFE cap diam. 10x75 mm
- PTFE cable with 3 Cu Ag conductors section 0.38 mm², PTFE insulated, 2 red and 1 or 2 white
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 30 KV AC for 60" (laboratory test performed with probe immersed in saline solution)
- Maximum temperature 220°C
- Construction in accordance with rules €
**PT100V**

- PT100 RTD sensor according to DIN 43760
- Fiberglass resin cap diam. 11x3x60 mm
- Silicone cable with 3 or 4 CuSn conductors section 0.22 mm², silicone insulated, 2 red and 1 or 2 white, aluminium taped with metal guard wire
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60”
- Maximum temperature 180°C
- Construction in accordance with rules

**PT100T**

- PT100 RTD sensor according to DIN 43760
- Cylindrical silicone cap diam. 6x60 mm
- Silicone cable with 3 or 4 CuSn conductors section 0.22 mm², silicone insulated, 2 red and 1 or 2 white, aluminium taped with metal guard wire
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rules
**TEMPERATURE PROBES AND ACCESSORIES**

**PT 1000**

**PT1000S**
- PT1000 RTD sensor according to DIN 43760
- Cylindrical silicone cap diam. 6x25 mm
- Silicone cable with 2 copper conductors section 0,22 mm², silicone insulated, 1 red and 1 white
- Standard length 2,5 m (other lengths on request)
- Dielectric strength: 2,5KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rules

**PTC - NTC**
- Cylindrical shape diam. 6x25 mm about
- Silicone cable with 2 copper conductors section 0,22 mm², silicone insulated
- Standard length 2,5 m (other lengths on request)
- Dielectric strength: 2,5 KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rules

Platinum temperature probes with 1000 ohm reference resistance with two wires only.

Ideal probe in cases where the same is located at a considerable distance from the acquisition device.
PTC temperature probes standard and on customer specifications

Probe used for the control the temperature of transformer and motors windings

PTCK

- Fixed threshold PTC sensor according to DIN 44081-44082
- Cylindrical shape diam. 3x10 mm about
- Two-wire cable section 0,14 mm² PTFE insulation
- Standard length 0,5-2,5 m
- Dielectric strength: 660 V AC unlimited work
- Shutter temperature from 70°C to 190 °C ± 5°C
- Construction in accordance with rules EC

Temperature-dependent color coding according to DIN 44081 / DIN 44082

<table>
<thead>
<tr>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>105</th>
<th>110</th>
<th>115</th>
<th>120</th>
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<tbody>
<tr>
<td>WH</td>
<td>WH</td>
<td>GE</td>
<td>RE</td>
<td>BL</td>
<td>BR</td>
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<td>GR</td>
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<tr>
<td>BR</td>
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</table>

<table>
<thead>
<tr>
<th>135</th>
<th>140</th>
<th>145</th>
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</thead>
<tbody>
<tr>
<td>RE</td>
<td>WH</td>
<td>WH</td>
<td>BK</td>
<td>BL</td>
<td>BL</td>
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<td>WH</td>
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</tr>
<tr>
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<td>BK</td>
<td>BK</td>
<td>BK</td>
<td>RE</td>
<td>BR</td>
<td>GE</td>
<td>RE</td>
<td>BR</td>
</tr>
</tbody>
</table>
TEMPERATURE PROBES AND ACCESSORIES

Thermocouples for temperature control silicone or PTFE insulated, with protected or exposed joint.

K TYPE - ANSI/MC96,1

- Thermocouple according to ANSI/MC96,1
- Cylindrical silicone cap diam. 5x25 mm or PTFE cap diam. 3x25 mm
- Silicone/PTFE yellow cable with two copper conductors section 0.22 mm², silicone/PTFE insulated, 1 yellow (+) 1 red (-)
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rules

J TYPE - ANSI/MC96,1

- Thermocouple according to ANSI/MC96,1
- Cylindrical silicone cap diam. 5x25 mm or PTFE cap diam. 3x25 mm
- Silicone/PTFE black cable with two copper conductors section 0.22 mm², silicone/PTFE insulated, 1 white (+) 1 red (-).
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rules

T TYPE - ANSI/MC96,1

- Thermocouple according to ANSI/MC96,1
- Cylindrical silicone cap diam. 5x25 mm or PTFE cap diam. 3x25 mm
- Silicone/PTFE blue cable with two copper conductors section 0.22 mm², silicone/PTFE insulated, 1 blue (+) 1 red (-)
- Standard length 2.5 m (other lengths on request)
- Dielectric strength: 2.5 KV AC for 60”
- Maximum temperature 200°C
- Construction in accordance with rule
PT100 DIN-B

Temperature sensors in cylindrical pipe in stainless for oil transformers

The type of probes, the length of the pipe and the fixing systems are determined by customer’s specifications

PT100 DIN-B

- Head DIN-B
- Cylindrical pipe in stainless AISI 304
- Available lengths 100-150-200 mm
- Protection grade IP 67
- Cable gland: PG 13,5
- Nut fixing: ½” – ¾” GAS MALE-FEMALE
  (other dimensions and systems available)
- Dielectric strength: 2,5KV AC for 60°
- Possibility of use with different probes types
- Ceramic base for probes connection
- Maximum temperature 150°C
- Construction in accordance with rules

PT100 DIN-B 4/20 mA

- Head DIN-B
- Cylindrical pipe in stainless AISI 304
- Available lengths 100-150-200 mm
- Protection grade IP 67
- Cable gland: PG 13,5
- Nut fixing: ½” – ¾” GAS MALE-FEMALE
  (other dimensions and systems available)
- Dielectric strength: 2,5KV AC for 60°
- Possibility of use with different probes types
- PT100 4-20mA converter
- Default temperature range: -20 +150°C to 4-20mA
- Input/Output range: programmable
- Maximum temperature range preset from -20 +150°C to 4-20mA
- Construction in accordance with rules
Junction box for probes in die-cast aluminium

- Terminal box ready to connect one or more probes series complete with earth terminal and numbering
- The spring contact is particularly suitable in the presence of vibrations, due to this the box is suitable to be installed on board of transformers
- On demand is available wiring diagram and installation instructions customized
- The box is equipped with input and output gland
- The probes are equipped with elastic clips for the recognition of the phase (R, S, T or U, V, W)
- Realisation of different kind of box and probes in function of customer needs

Technical features

- Dimensions: 140x115x60 mm
- Material: die-cast aluminium
- Standard gland in plastic material, nickel-plated brass on request
- Protection degrees IP55
- Spring terminal block contacts section 2,5 mm²
- Label with customized electrical scheme and logo
- Construction in accordance with rules

Diel example of standard box*

*Customization on request
Junction box for probes in thermoplastic material

- Terminal box ready to connect one or more probes series complete with earth terminal and numbering
- The spring contact is particularly suitable in the presence of vibrations, due to this the box is suitable to be installed on board of transformers
- On demand is available wiring diagram and installation instructions customized
- The box is equipped with input and output gland
- The probes are equipped with elastic clips for the recognition of the phase (R, S, T or U, V, W)
- Realisation of different kind of box and probes in function of customer needs

Technical features

- Dimensions: 120x160x80 mm
- Material: thermoplastic
- Standard gland in plastic material, nickel-plated brass on request
- Protection degrees IP55
- Spring terminal block contacts section 2,5 mm²
- Label with customized electrical scheme and logo
- Construction in accordance with rules CEE

Diel example of standard box*

*Customization on request